A GUIDE TO THE LITERATURE ON TRADITIONAL COMMUNITY-BASED FISHERY MANAGEMENT IN THE ASIA-PACIFIC TROPICS

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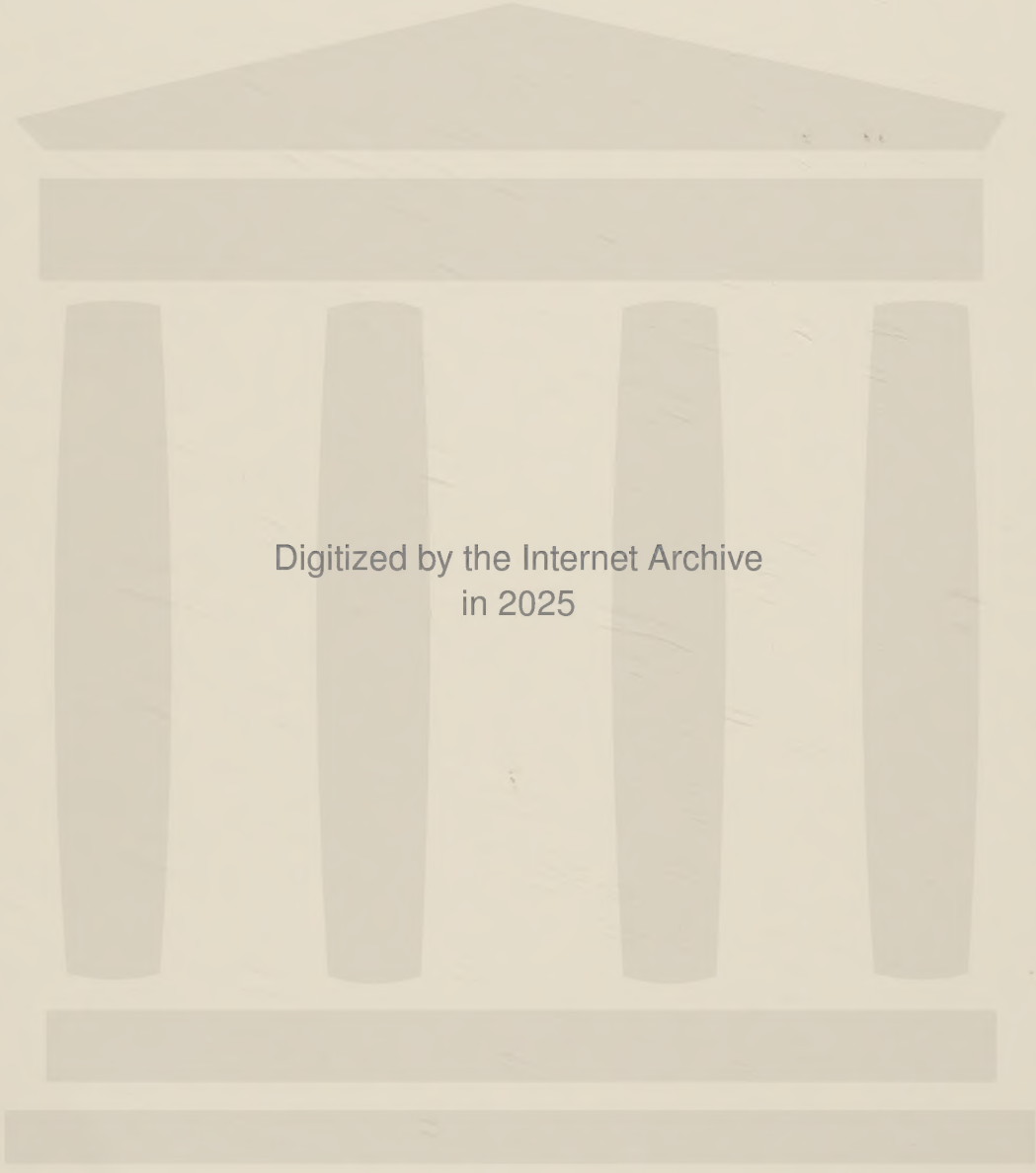

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A GUIDE TO THE LITERATURE ON TRADITIONAL COMMUNITY-BASED FISHERY MANAGEMENT IN THE ASIA-PACIFIC TROPICS

by

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PREPARATION OF THIS CIRCULAR

During the last 15 years there has been a surge of interest in traditional community-based systems of marine resource management. Judging from requests for information and "reading lists", there has also been a noticeable increase in the number of university theses and dissertations on the subject in the Asia-Pacific Region.

It is largely in response to those frequent requests that this guide to *some* of the published and unpublished literature has been written. No pretence is made at completeness; the author has included only some of the materials that he has collected.

Supplementary materials from the Pacific Islands will be published occasionally in the *Information Bulletin of the Special Interest Group on Traditional Resource Management and Knowledge*, of the South Pacific Commission.

Ruddle, K.,
A guide to the literature on traditional community-based fishery management in the Asia-Pacific tropics.
FAO Fisheries Circular. No. 869. Rome, FAO. 1994. 114 p.

ABSTRACT

This Circular is a guide to the literature on traditional fisheries management systems in the Asia-Pacific tropics. The introductory section discusses the geographical distributions of such systems, their principal characteristics including authority, rights, rules, and monitoring, accountability and enforcement. It notes that information on these systems is fragmentary and much remains anecdotal and unsynthesized. It calls for greater research efforts on these systems and highlights some major research issues including the nature of management boundaries and the traditional ecological knowledge base. The main body of the Circular provides, on a country by country basis, a summary of the present knowledge on traditional management systems of marine and estuarine fisheries in the Asia-Pacific tropics based on the literature available to the author.

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The FAO Fisheries Circular is a vehicle for distribution of short or ephemeral notes, lists, etc., including provisional versions of documents to be issued later in other series.

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INTRODUCTION: DISTRIBUTION, CHARACTERISTICS AND RESEARCH NEEDS

A scattered and fragmented literature reveals that traditional community-based systems of marine resource management are or were utilized widely throughout the Asia-Pacific Region to manage coastal fisheries. Such systems are particularly widespread in the Pacific Islands. Existing examples in Asia have been documented over a wide yet discontinuous geographical range, extending from Japan to Sri Lanka.

But, for most localities, the tenurial relationship of small-scale fishermen to resource areas and resources is not well known.[1] There are few comprehensive accounts of the structure and functioning of community-based fisheries management systems and their institutional arrangements. The problem is compounded by the fragmentary and commonly anecdotal nature of, and confusion of tenses in, the existing literature, the lack of recent fieldwork in most places, and the rapid decay and disappearance of such systems since Western contact (Ruddle, 1988a). Thus the remaining inshore fisheries management systems are commonly hybrids of traditional and modern components, with the former decaying rapidly (Ruddle and Johannes, 1985; 1990).

Most fishermen in the Asia-Pacific Region, as elsewhere in the tropics, are predominantly part-timers, combining fishing and farming, and other activities. It is typical of this region that land and sea and their associated occupations are seen as economically and nutritionally complementary domains, and not dichotomized along Western lines into "ownable land" and "unownable sea" (Ruddle and Akimichi, 1984a; Ruddle, 1988a).

This is often expressed in the concept of "corporate estate", a territory held jointly by a kinship-based group and embracing a connected range of terrestrial and marine resource zones, which is widespread in the South Pacific (Ruddle and Akimichi, 1984a). Examples include the Hawaiian *ahupua'a* (Meller and Horowitz, 1987), the Yap *tabinau* (Lingenfelter, 1975; Schneider, 1984), the Fijian *vanua* (Ravuvu, 1983), the Marovo (Solomon Islands) *puava* (Hviding, 1990), the Cook Islands *tapere* (Crocombe, 1967), and the estate of the Yolngu aboriginals of North Australia (Davis, 1984; 1985). Such estates provide a collection of rights and implied duties to the social communities (the "corporate group") which possess them (Radcliffe-Brown, 1952). On high islands in the Pacific "estates" are usually wedge-shaped, extending from a central watershed, along lateral ridges into inshore marine waters. These were self-contained units that included a complete set of the resource areas and habitats required to provision the society which inhabited them.

The Geographical Distribution of Systems

Recent documentation has revealed the widespread existence of often time-honoured, community-based fisheries management systems throughout the world. While the Asia-Pacific Region is especially rich in such systems (Ruddle and Akimichi, 1984b; Ruddle and Johannes, 1985; 1990), they also occur in the Caribbean, South America, Africa, and the Middle East. They are not restricted to developing countries. Similar systems are used by both aboriginal populations and communities of European ancestry in North America, Australia and New Zealand, as well as in several countries of Europe and Japan (Ruddle, 1994).

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[1] Partly this is because only in the last two decades has it been realized that "sea tenure", or the way in which fishermen perceive, define, delimit, "own", and defend their rights to inshore fishing grounds exists at all (Emmerson, 1980; Acheson, 1981; Ruddle and Akimichi, 1984a; Durrenberger and Palsson, 1987).

Although the Asia-Pacific Region is particularly rich in such systems, even there they are far from having been well-documented. They are poorly studied in Asia, and knowledge of systems in the Pacific Basin is patchy.

In both continental and insular Southeast Asia only vestiges of what probably were more widespread systems remain. Conspicuous by their absence are either historical or contemporary reports of systems from continental Southeast and East Asia. Field research and archival study of the records of former colonial administrations is likely to prove profitable in filling these gaps.

There is scant documentation of traditional marine resources management systems in the Philippines, an archipelagic nation with a diversity of cultures and rich local fishing traditions, and where such systems are to be expected. More detailed field research is likely to reveal the widespread existence of traditional community-based systems in the Philippines, since they appear to have been commonplace historically (Ruddle, 1994). Further, although today the coastal or "municipal fisheries" of the Philippines are operated under an open-access regime, several examples of traditional community-based systems of coastal fisheries management have been documented for different parts of the country.

Similarly, contrary to what might be supposed for a massive archipelagic nation like Indonesia, with its diversity of local fisheries traditions, there are surprisingly few documented examples of traditional marine resource management systems in the country (Polunin, 1984; 1986). However, more recent research demonstrates that traditional, community-based fisheries management systems have a long and effective history in many scattered parts of Indonesia, and that in some places they have been implemented in recent decades as fishing developed in hitherto unexploited areas, as occurred on the Indian Ocean coast of East Java (Kendrick, 1993).

In South Asia traditional community-based fisheries management systems have been documented in Bangladesh, India and Sri Lanka. But few in-depth studies have been conducted in the sub-region, and the information available remains fragmentary.

There is little information available on traditional community-based fisheries management systems in Bangladesh. A scattered literature reveals that such systems are widespread in India but, with the exception of Mathew's (1991) study of fisheries management in Pulicat Lake, Tamil Nadu State, most reports are highly fragmentary and do not give a useful picture of management systems. There is a need for basic field research and archival studies to present a fuller picture of the types, structure and functioning of community-based fisheries management systems in India.

Although according to statutory law coastal fisheries in Sri Lanka are managed under open access, in many localities fisheries operate under locally-sanctioned systems of limited entry. A pioneering study on beach seine management was conducted in Sri Lanka by Alexander (1977, 1982), and the community-based management of fixed gear in lagoon and estuarine fisheries has been reported on by Atapattu (1987).

Such systems have been widely, but usually incompletely, described for the Pacific Basin. Traditional management systems have now either completely or largely disappeared from the Commonwealth of the Northern Mariana Islands (Freycinet, 1824; Thompson, 1945; Dugan, 1956; Souder, 1987; Amesbury *et al.*, 1989) and some countries of Micronesia and Polynesia, whereas they remain in many other parts of those same regions.

The continued importance of traditional systems varies considerably in Micronesia. For example, within the Federated States of Micronesia, in Yap State and the outer islands it remains important,

as it does in Chuuk State and the outer islands of Pohnpei State, whereas it has largely disappeared from the main island of Pohnpei and from Kosrae (Foster and Poggie, 1992; Ruddle, 1994). There is little information on the current status of systems in the Marshall Islands. On Nauru it is likely to have disappeared entirely, although in former times there were property rights to inshore waters (Petit-Skinner, 1983). In Palau the traditional community-based marine resource management system has slowly eroded since the Japanese administration formally appropriated the area below the high water mark (Johannes, 1981; 1991; McCutcheon, 1980; 1981).

In Polynesia traditional systems have all but disappeared in the State of Hawaii, U.S.A, and have been severely eroded in American Samoa (Wass, 1982; Johannes, 1988). Elsewhere they remain largely unstudied. In the Kingdom of Tonga they were abolished by Royal Proclamation in 1887 and, although residual notions of village-based rights persist in the outer islands, they have no practical implication these days (Fairbairn, 1992). There is little information available regarding traditional community-based marine resources management on Wallis, and none for Futuna. On Wallis, although in principle family rights extend to the seaward slope of the reef, the lagoon is regarded as being open of access. The only exclusive rights are for the removal of sand, which can be done only in waters fronting the collector's own village. Districts control their own sections of reef, but marine boundaries are weakly defined compared with those on land (Pollock, 1992). Similarly, there is little information available on traditional community-based marine resource management for French Polynesia (Tetiarahi, 1987), or for Tuvalu.[2]

In contrast, traditional systems remain strong in many parts of Micronesia and Polynesia, and especially so in Melanesia. In Kiribati, of Micronesia, there is a rich inshore fisheries tradition and lore that includes detailed local traditional rights and regulations. Many traditional management practices have been codified by island by-laws, and so incorporated into contemporary management (Ruddle, 1994). And in Yap State, of the Federated States of Micronesia, traditional fishing rights are among the most complex in the Pacific Basin (Anon., 1987; Johannes, 1988; Smith, 1991). There the supremacy of traditional rights is enshrined in the State Constitution for 12 miles seaward from an island baseline, "...a line following the seaward edge of the reef system..." (Yap State Code 18:27). Thus traditional leaders theoretically have total control over inshore waters, and the government is limited to intervening only for conservation and protection in the State Fishery Zone (Smith, 1991). In the Cook Islands, Niue, Tokelau, and Western Samoa, of Polynesia, elements of traditional systems have been incorporated into contemporary fisheries management (Ruddle, 1994).

Traditional systems remain extensive and diverse in Melanesia, although little studied. They are best described for Papua New Guinea and Solomon Islands, but have been less studied in New Caledonia (Teulières, 1990; 1991), Fiji (Zann, 1983; Kunatuba, n.d.; Veitayaki, 1990) and Vanuatu.[3]

In New Caledonia elements of the traditional marine resources management system in the Nenema Zone have been described by Teulières (1990, 1991). These are the first studies of local management of marine resources in the country.

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[2] Separate entries have not been included for Nauru, Tuvalu and Wallis and Futuna. Because the early sources of information are the same, a joint entry has been made for American Samoa and Western Samoa.

[3] They have also been well-described for Torres Strait Islands (Johannes and Macfarlane, 1984; 1990; 1991; Neitschmann, 1985; 1989). But because that region is part of Australia, it is not included in the present volume.

Traditional systems of fisheries management in Vanuatu remain to be studied in depth. Brief descriptions have been provided by Taurakoto (1984) and Fairbairn (1990). The situation is similar for Fiji.

In Papua New Guinea most descriptions of traditional systems of fisheries management have been based on brief surveys (e.g., Frielink, 1983a; 1983b; Otto, n.d.; Turner, 1989; Walter *et al.*, 1986). More complete descriptions are available for Ponam Island (Carrier, 1981; Carrier and Carrier, 1989) and the Trobriand Islands (Williamson, 1989; Tom'tavala, 1991).

From a survey conducted in 1985, at 43 locations, the common elements of the customary fishing rights systems in Solomon Islands were synthesized and described by Ruttley (1987). Despite the many weaknesses in the design and conduct of the survey, and the resultant information gaps, the information generated provides a general overview of the main characteristics of traditional community-based fishery management systems in Solomon Islands. However, because of the highly complex cultural variations in the country the survey results provide only superficial information. To be of any practical usefulness, they require supplementing by in-depth, society-specific field research, such as that conducted in Marovo Lagoon, Western Province (Hviding, 1990), or the Lau and Langalanga lagoons of Malaita Province (Akimichi, 1978).

Thus there is a need for basic field research and archival studies to present a fuller contemporary and historical picture of the types, structure and functioning of community-based fisheries management systems throughout the Asia-Pacific Region.

The Principal Organizational Characteristics of Traditional Community-based Fisheries Management Systems

It is evident, then, that in many parts of the Asia-Pacific Region coastal fisheries are or were managed traditionally by community-based systems of property rights and associated regimes of rights and rules that closely reflect social organization and local power structure. Such systems seem not to have been based principally on ecological conditions, which would be the case were their primary purpose resource conservation. Rather, as would be expected, since property is a social relationship that defines its holder's security of claim to a resource or to the services or benefits it provides, they reflect a correlation among property, property rights, and social organization (Ruddle, 1988b). Management systems in the aquatic domain often, but not always, mirror those on land.

In these traditional community-based systems of marine resource management an individual's sea rights depend on his or her social status within a corporate community, which ranges from villages through clans, sub-clans, and lineages, to the family. Resource territories and user groups are defined. Resource use is governed by rules and controlled by traditional authorities who mete-out sanctions and punishments for infringement of regulations. Conservation for sustainable resource use is a widespread objective of these systems (Ruddle, 1988a).[4]

I: AUTHORITY

In traditional community-based marine resource management systems, resource control and management is usually vested in traditional authority, the nature of which varies according to social organization. Four principal types can be recognized: traditional secular leaders, traditional religious

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[4] For a fuller treatment see Ruddle (1994).

leaders, specialists, and rights-owners. These categories frequently overlap, and responsibility is divided and shared.

(a) Secular Leaders

In many societies a group of traditional leaders or an organization, usually some kind of "village council", manages marine resources by regulating the use of community sea space and protecting resources against over-exploitation. However, in many Pacific Islands, in particular, land and sea is disposed of by a chief, who exercises his authority on behalf of the entire community.

(b) Religious Leaders

The role of religious leaders in traditional resource management is widespread in the Asia-Pacific Region. These can be both traditional religious leaders, as in Indonesia and in parts of the Pacific Basin, or members of a formally organized church, as in Sri Lanka.

(c) Specialists

Commonly, marine resources are managed by fisheries specialists, who function under some form of higher authority. Such "master fishermen" are particularly common in Pacific Island societies.

(d) Rights-Holders

Rights-holders themselves commonly have management authority over marine resources. Frequently, this level of authority is vested in the senior person of a lineage, family, or other small social group.

II: RIGHTS

Under traditional community-based systems marine resource exploitation is governed by use rights to a property. A property right is a claim, consciously protected by customary law and practice, to a resource and/or the services or benefits that derive from it. Such a grant of authority defines the uses legitimately viewed as exclusive, as well as the penalties for violating those rights. The characteristics of property rights may vary situationally. Common characteristics are exclusivity, the right to determine who can use a fishing ground, transferability, the right to sell, lease, or bequeath the rights, and enforcement, the right to apprehend and penalize violaters of the rights. The right of enforcement, and in particular that to exclude the free-riding outsider, is a key characteristic, for without it all other rights are diminished either actually or potentially.

Almost universal throughout the Asia-Pacific Region is the principle that members of fishing communities have primary resource rights by virtue of their status as members of a social group. Such rights to exploit fisheries are subject to various degrees of exclusiveness, which depends on community social organization and local culture. Most commonly, traditional fisheries rights apply to areas, but superimposed on these may be claims held by individuals or groups to a particular species or to a specific fishing technology.

Traditional rights to marine resources may be exclusive, primary, or secondary, and may be further classified into rights of occupation and use.[5] The relationship between the two main types, primary and secondary, is an important and complex characteristic of many traditional management systems, in which overlapping and detailed regulations on the use of technologies and particular species are widespread. Individual rights as sub-divisions "nested within" corporate marine holdings occur widely throughout the Asia-Pacific Region. Rights of transfer and loan and shared property rights also occur.

(1) Exclusive Rights

Exclusive rights have been handed on from generation to generation through ancestral families, spirits or gods, and are validated by historical-mythological associations. In the Pacific Islands myths, legends and oral history make frequent reference to islanders' exclusive rights to their islands' resources (Pulea, 1985). Subsequently, fishing rights in defined territories have been defined by customary law.

(2) Primary Rights

Most commonly these are rights to which a group or an individual is entitled via inheritance (*i.e.*, a birthright), by direct descendance from the core of a descent-based corporate group. Primary rights are generally comprehensive, since only they confer access to all resources within a defined territory. Inheritance, ancestral interests, social obligations, and cooperative relationships within a social group provide continuity of ownership and rights.

(3) Secondary Rights

Secondary rights are more limited than primary rights, often being restricted to specific fishing methods. They are acquired through affiliation with a corporate group, by marriage, traditional purchase, exchange, as a gift, or as reciprocity for services. Sometimes they may be inherited. Secondary rights are often given to residents of inland villages lacking direct access to the coast, particularly when such villages have historical and kinship ties with a coastal village.

Systems with "Nested Rights"

In some societies rights to fisheries, which are usually to areas, are overlain by other rights, generally those to species and those to gear types. Most are quite simple, like those to locations with stone fish traps.

One complex and unusual case of such rights is that of Ponam Island, Manus Province, Papua New Guinea, where the system of rights is composed of three main independent and overlapping elements: (1) ownership of reef and inshore marine waters; (2) ownership of species; and (3) ownership of fishing techniques (Carrier, 1981; Carrier and Carrier, 1989). There, owners of sea and reef areas do not have exclusive ownership of their tenured waters, owing to strict limits set by these countervailing, nested rights.

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[5] Such traditional rights are better defined as those to use rather than to own. Further, rights to use can be exclusive, since they can imply primary rights-holders may have a subsidiary right to prevent others from using certain resources within the area over which traditional control is exerted (Pulea, 1985).

The Right of Transfer and Loan

Some traditional management systems permit the permanent, temporary, or occasional transfer of rights to other social units. Often, temporary and occasional transfer requires users to compensate rights-owners in cash or, more commonly, in kind, usually with a portion of the catch. In other societies, however, individual fishermen are proscribed by either statutory or customary law from transferring their rights.

Shared Rights

In some parts of the Asia-Pacific Region areal rights are shared between or among different corporate communities. Commonly shared rights have deep historical roots, and invariably sharing is done only for the most productive waters or where kinship ties are strong.

III: RULES

Rules give substance and structure to property rights by defining how a right is to be exercised, through specification of required, permitted and forbidden acts in exercising the authority provided by the right. Thus, whereas a right authorizes a fishermen to work a specific fishing ground, his options in exercising it are governed by rules which may, for example, specify gear type used or seasonal restrictions, among other limitations. The more complete a set of rights, the less exposed are fishermen to the actions of others.

Basic rules define the geographical areas to which rights are applied, define those persons eligible to fish within a community's sea space, and govern access of outsiders. Operational rules govern fishing behaviour, gear externalities, assignment issues, as well as specify unacceptable fishing behaviour, conservation practises, and distribution of the catch within the community.

(1) The Definition of Fishing Territories

In the Asia-Pacific Region the sea territory of a social group is commonly, but not always, defined by proximity or adjacency to its settlement(s), and by lateral and seawards boundaries. As a general principle, the exclusive fishing territory of a community is in the adjacent marine waters, within the reef. But this varies considerably according to both local history and the more recent processes of national modernization.

In most places communities maintain exclusive rights to all known adjacent submerged reefs, which are named and owned exclusively by particular families, clans, municipalities, islands, groups of islands or atolls, as the local social organization dictates. Seawards of the reefs the degree of exclusiveness of rights gradually declines.

(2) Eligibility Rules

In addition to holding rights, in many societies the persons who can actually engage in fishing are limited by community-based, national or cultural rules. Whereas in a great many societies in the Asia-Pacific Region membership of a corporate descent group, and thus inheritance, and/or residence are the only rules that must be satisfied in order to become a fisherman, in others further preconditions must be met. Such eligibility rules include caste membership, gender and skill level, among others.

(3) Inter-Community Access Rules

Access controls are applied to outsiders; people from other social groups. There is often boundary permeability between neighbouring groups, a consequence of long friendship, kinship or other close association. Boundaries are less permeable the more distant the "outsider" group is either socially or geographically. But increased commercial resource use often leads to strong access controls, even on close neighbours.

Throughout the Asia-Pacific Region, the rights of outsider fishermen are usually closely specified by rules defining access conditions. However, there is considerable variation in local details. Invariably, such rules require that prior permission be obtained before commencing fishing. Failure to do so is usually regarded as trespass, the penalties for which can be severe. Commonly, rules specify that some form of fee, compensation or royalty be paid once permission has been granted.

In some cases outsiders seeking fish for subsistence are allowed free access, whereas commercial fishermen might be granted access on payment of cash or kind, or prohibited entirely. Almost universally, commercialization and commoditization results in a demand for fees or prohibition, even when the target species has not traditionally been harvested by the "host" community. Species restrictions are sometimes placed on outsiders.

(4) Use Behaviour Rules

(a) Gear Rules

Gear rules are widespread in the Asia-Pacific Region. Gear perceived of as either deleterious to fish stocks or habitats is widely prohibited. Similarly, generally in the interests of equity, gear regarded as being too efficient or of exacerbating socio-economic cleavages within a community is also often banned. Many gear rules are established to prevent gear externalities.

(b) Temporal Allocation Rules

In many places rules are enforced to promote both orderly and equitable fishing. Frequently, such rules limit the number of canoes in a line, and ensure that the position of canoes is changed in a specific order, so all fishermen can share equally in the best spots. Lottery systems for allocating space-time among fishing groups are widespread, especially in South Asia.

(c) Fishing Behaviour Rules

Almost universal are local rules aimed at promoting orderly fishing as well as protecting fish schools. Such rules are detailed and usually locally specific. Examples include the ban on individual fishing with flares, in favour of group efforts, acceptable levels of noise, and the way in which boats and gear must be handled so as not to disturb schooling fish.

(d) Species Rules

Rules are common regarding the harvest of certain species. Widespread, for example, is that turtles are reserved for higher ranking persons, such as chiefs in the Pacific Islands. Other rules forbid the harvesting of totemic and sacred species.

(5) Conservation Rules

The conservation intent within traditional community-based marine resource management systems is controversial (Ruddle, 1994). It is important, therefore, not to assume *a priori* that traditional management systems are intentionally conservationist. Rather, local rationale and possible conservational functions must be examined for in each case.

If community-based traditional marine resource management systems were originally designed as a conservation measure, admittedly an unprovable assumption in most places, they would have been the most widespread conservation measure employed throughout the Pacific Basin. Widespread in the Asia-Pacific Region is the use of "closed seasons" that follow local knowledge about the spawning periods of key fish species and prohibit their capture during such periods, together with other types of customary fishing regulations, often based a non-ecological rationale such as religious taboos, that appear to have similar conservational implications (Johannes, 1978).

Such practises are not static. And some of the new regulations that village communities devise to cope with changing technology and fishing practises are explicitly conservationist.

A wide range of conservation rules was traditionally employed by many communities in the Asia-Pacific Region, and especially in Oceania (Johannes, 1978; 1981; 1982), to ensure sustained yields. Some were clearly designed to conserve stocks, whereas others also functioned coincidentally as conservation devices. Among these were the live storage or freeing of surplus fish caught during spawning migrations; the use of closed seasons (particularly during spawning); the placing of taboos on fishing areas; the reservation of particular areas for fishing during bad weather; size restrictions (although this was uncommon in Oceania); and, in recent times, gear restrictions (Johannes, 1978).

(6) Distribution of Catch Rules

Rules defining access to harvested fish are widespread in the Asia-Pacific Region. These are an extremely important set of rules in many societies since, in terms of equity within a community, access to fish once harvested can be as or more important than access to fishing grounds (Collier *et al.*, 1979; Kendrick 1993). Such rules include those to provision the family and community, those required as subsequent and continual repayment for the acquisition of fishing rights, and those enmeshed in general community sharing and reciprocity and related norms concerning equity and fairness (Ruddle, 1994).

IV: MONITORING, ACCOUNTABILITY AND ENFORCEMENT

If rights are to be meaningful, provision must be made within the system for monitoring compliance with rules and imposing sanctions on violators. Under community-based marine resource management systems in the Asia-Pacific Region, monitoring and enforcement are generally undertaken within the local community; resource users policing themselves, and being observed by all others as they do so.

For a variety of reasons, traditional authorities frequently imposed temporary or permanent bans, as well as spatial, temporal, gear, or species restrictions on the exploitation of marine resources. These commonly took the form of taboos.

V: SANCTIONS

Sanctions were widely invoked throughout the Asia-Pacific Region for the infringement of fisheries rights and the breaking or ignoring of locally-formulated rules governing fishing and other marine resources uses. Four principal types of sanctions were widely invoked; social, economic, physical punishment, and supernatural.

(a) Social Sanctions

This category includes ridicule, shaming, ostracism, and banishment. Ridicule was widely used in Polynesian societies.

(b) Economic Sanctions

This category includes monetary and in-kind fines, destruction of gear and forced labour, among others.

(c) Physical Punishment

Physical punishment, including death, was a not uncommon penalty in the region, and especially throughout Oceania, for the violation of rules.

(d) Supernatural Sanctions

These are all-pervasive throughout the Region, and fear of them reinforces the other types of sanction.

Major Research Issues for the Asia-Pacific Region

Most information on community-based marine resources management systems in the Asia-Pacific Region remains largely anecdotal and unsynthesized. No nation has a comprehensive knowledge base on the range of types, functions and statuses of its systems. Equally lacking are the essential complementary and systemic data sets on basic ecological, biological, general fisheries, and socio-economic settings in which such management systems are embedded.

Further, most of the fragmented and ad hoc information available is dated to the point of little more than historical utility by the rapid changes at national and local levels as a result of modernization. Thus detailed, systemic, location-specific, contemporary studies of community-based marine resource management systems and of their socio-economic, political, ecological contexts are indispensable, as is verification of recently completed research.

Although more is known about such systems in the Pacific Basin than other regions, there are still major knowledge gaps within the Region. The principal ones are:-

(i) in Micronesia and Polynesia more needs to be learned about the current status of traditional community-based management systems throughout the entire area. But information is needed especially for American and Western Samoa, Chuuk, Kosrae and the outer Caroline Islands of the Federated States of Micronesia, the Marshall Islands, French Polynesia, Tuvalu, and Wallis and Futuna; and

(ii) much more needs to be known about the vast range of systems in Melanesia, only a few of which have been studied, and then mostly just by reconnaissance surveys. In particular, systems in Fiji, Irian Jaya Province of Indonesia, New Caledonia, and Vanuatu are in particularly urgent need of basic description, since almost nothing is known about them. Further surveys, accompanied by in-depth field studies, are required to expand the information available for Papua New Guinea and Solomon Islands.

In Asia there is a pressing need for archival and field study of countries where there is little known at all. This means *all* of continental Southeast Asia: Burma (Myanmar), Cambodia, Malaysia, Thailand, and Vietnam. Even in countries where, according to statutory law, coastal fisheries are under open access, community-based informal institutions often exist to regulate access either to the sea or to the harvest when landed, as in Java, Indonesia (Collier *et al.* 1979; Kendrick 1993).

In insular Southeast Asia virtually nothing is known about systems in East Malaysia (Sabah and Sarawak), and much more needs to be known about those in the Philippines. There are major information gaps for much of Indonesia, especially Irian Jaya and Maluku.

Much more information is required for all of South Asia. In that sub-region information is virtually non-existent for Bangladesh, scattered and very incomplete for India, and fragmented and mostly out-dated for Sri Lanka.

(1) Research on Fisheries Resource Systems

Since systems specifically designed to manage coastal resources cannot be separated from the socio-cultural and ecological systems in which they are embedded, information is required on at least the following major parameters of the larger system (Ruddle, 1994):

(i) the ecological structure of the system, and the basic aspects of the biology and productivity of the relevant living components;

(ii) the principal socio-cultural characteristics of the fishing community, by gender and age, including:

  (a) demographic characteristics;
  (b) socio-cultural factors (religion, ethnicity, social structure, caste, degree of social, economic, occupational, and cultural homogeneity);
  (c) occupational and geographical mobility;
  (d) attitudes (risk, time horizon, interdependency, and cooperation);
  (e) economic activities of households (ownership of productive assets, economic role of fishing, other economic activities);
  (f) geographical location (residential proximity to the fishery);
  (g) community size and number of fishers by gender and age; and
  (i) history of non-traditional organization/ cooperative behaviour (type, formal/informal, purpose, structure, membership, and outcomes).

(iii) the energy flow through the system linking the human community with its natural resource base; and

(iv) the estimation of the multi-species harvest productivity, definition of surpluses that may be available after local needs have been satisfied, and product distribution and/or marketing systems.

(2) The Nature and Management Characteristics of Traditional Fishery Resource Territories

Given the worldwide phenomenon of the impingement of externally controlled, commercial and large-scale fisheries on inshore waters hitherto controlled locally by traditional, small-scale fishing communities, and an increasingly frequent official realization of the need to counteract this tendency, a critical area for research is the nature and characteristics of the boundaries of traditional fishery resource territories, and the rights, rules, authority structure, and enforcement associated with them. There is, thus, a particularly important need to identify and define traditional marine resource boundaries, in order to provide an effective legal basis for traditional activities while accommodating compatible development in fisheries and other sectors of the economy (Ruddle and Johannes, 1985; Ruddle, 1988b).

"Traditional" boundaries should be recorded precisely. This has more practical than academic urgency, because, when a resource becomes commercially valuable, fishing communities will quickly invent "traditional" fishing rights and boundaries to ensure that they obtain the most benefit.[6]

To facilitate abstraction of comparative data on an areal basis from secondary sources, these research needs have been posed here as related sets of questions (Ruddle, 1988b).

(a) On the Nature of Boundaries

- What indications are there that traditional marine boundaries exist (existed)?
- What are (were) the purposes of these boundaries (*e.g.*, to protect resources, to allocate resources, to manage disputes, to demonstrate group identity, etc.,)?
- How are (were) such boundaries defined traditionally, and how did they evolve?
- What criteria are (were) used to locate boundaries (*e.g.*, depth contours, prominent landmarks, "seamarks", seaward extension of land boundaries)?
- What is (was) the seaward extent of the boundaries, and how are (were) they fixed?
- Are (were) the boundaries claimed by one community recognized by other groups in the locality?

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[6] It is very important to note that what is often labelled "traditional" may not be especially old-established. Here I use the term "traditional" self-referentially, and not to connote something necessarily deeply embedded in any local history. Present-day "traditional management" mostly will have little in common with that of the past; even where original principles still apply, demographic dynamics have changed, and even more so the socio-economic context in which management systems exist. The implications that today's tradition (custom) is "... substantially the same as ancient custom, or that even if it were it would have some special legitimacy, is false and misleading. The belief, however, is widespread and needs to be understood, and countered as far as possible" (Crocombe 1989:21). However, tradition is far from irrelevant; simply, its nature and content are always changing. It should be understood that "Custom is a practise rather than a principle. That is, custom is what people usually do. As behaviour changes, custom changes, as custom is the pattern of behaviour" (Crocombe 1989:23). Thus when custom becomes codified into statutory law it is, by definition, relocated from the realm of custom into that of law.

- Have traditional boundaries changed according to changed needs, altered perceptions of the resources contained, geomorphological changes, usurpation, etc?

- Do (did) internal sub-divisions exist nested within the outer boundaries (*i.e.*, are [were] there territories within territories)? (Is so, repeat the above questions for each sub-division.)

(b) On the Resources and Habitats Contained within Traditional Boundaries

- What is (has been) the traditional significance of the contained resources to the community claiming the territory?

- What is (has been) the significance of contained resources to outsiders?

- What is (was) the nature of the rights to resources within the bounded area?

- Can (could) traditional rights be transferred? If so, under what conditions, how and to whom? If not, why not?

- What is (was) the relationship between resource territories and the associated rights defined by traditional or customary law, and those defined by statutory law (also see below, Section 5)?

- What rules govern(ed) those rights?

(c) On the Permeability of Boundaries

- How permeable are (were) traditional rights boundaries?

- Can (could) outsiders exploit marine resources in the area? If so, under what conditions (*e.g.*, compensation, fee, reciprocity) and with what limitations (*e.g.*, gear type, species, seasonality, kinship, etc.)? If not, why not?

- Is (was) provision made for innocent passage through the territory? Are (were) any conditions imposed?

- To what extent are (were) provisions made for adjustments to access owing to physical (*e.g.*, geomorphological), legal, social, economic, or other kind of change?

(d) On the Nature of Boundary and Resource Control

- What is (was) the power structure and system of social control governing resource use?

- What is (was) the source of traditional authority governing resource use within the bounded area(s)?

- What are (were) the community-based institutions of management and how do (did) they function?

- What are (were) the mechanisms for enforcing the observation of rights and the integrity of the bounded area?

- What are (were) the methods of managing and resolving disputes over rights and boundaries, both among community members, and between the community and outsiders, and how effective are (were) these methods?

- What are (were) the provisions, if any, for compensation where boundaries or rights were transgressed, both by community members and outsiders?

(e) On the Adaptation of Boundaries and Rights

- How robust is (was) the system in its present (past) cultural context?

- In terms of robustness, have (did) traditional boundaries changed (change) according to changed needs, altered perceptions of the resources contained, geomorphological changes, usurpation, etc, and to what extent are provisions made for adjustments to access owing to physical (*e.g.*, geomorphological) change?

- How robust is (was) the traditional system in relation to commercial and/or cultural intrusions?

(3) The Traditional Ecological Knowledge Base Supporting Systems

The local cultural and social "roots" underlying traditional marine resource management systems must be thoroughly examined, and in particular the traditional knowledge base that links a system to its cultural context. Traditional knowledge and information transfer techniques of coastal-marine resources must be documented and analyzed, parallel with documentation of the related resource system (Ruddle, 1993a; 1993b; 1994).

(4) Linking Traditional Systems with Commercial-Industrial Systems

- What are the cash flows within the system and what is its cash-absorption capacity?;

- What are the relative advantages and opportunity costs of self-sufficiency as economically and ecologically appropriate strategies within a community?;

- Can excess productivity and specific commodities produced by the traditional sector be used to fulfil national needs for rent and national and/or international market demand?;

- Can the negative impacts of a cash economy on exploitation of resources controlled by traditional societies be mitigated? (As commercialization and commoditization inevitably develops and puts pressures on systems, local marketing arrangements must be included within the management design to ensure community benefits continue to flow, and that local or other elites do not emerge to capture and individualize the flow of benefits from the system);

- What useful links can be made between the traditional system and the development of appropriate technologies and institutions? and

- Do complementarities exist between given traditional fishery systems and national coastal resource development priorities?

(5) The Legal Support of Management Systems

That "tradition" is dynamic is demonstrated by traditional resource management systems that are uncodified and so can respond flexibly to change. Research is required on the nature of this adaptive flexibility of traditional management systems and their resilience when confronted by internal and external forces. Applied research should concentrate on the adaptive dynamics and resilience of systems, and emphasise the outcomes of processes where they interact with larger political and economic systems.

- First, the nature of the relationships between resource territories and the associated rights defined by customary law and those defined by statutory law must be clarified. In particular, it is important to understand what are (were) the consequences of local boundary formalization by statutory law (*e.g.*, legal definition and recognition).

- A much better distillation of the principles of the legal and institutional design of systems is required. A study is required of national fisheries legislation and its advantages or disadvantages as perceived both by fishermen and marine resource managers. This is important, since legislation introduced to protect community-based management systems could "fossilize" them by reducing or eliminating their adaptive flexibility. Formerly, many systems seem to have been able to adjust to changes in demographic, economic or ecological conditions. But these conditions are now changing at accelerating rates so that, to remain useful, the systems must adapt even more rapidly. Legislation that dilutes or removes this capacity is counter-productive.

- It is extremely important to document local systems of customary law that underpin and validate various types of management systems in the Asia-Pacific Region. In particular, it is important to examine the problems of implementation, monitoring, surveillance, and enforcement.

- In many places, legal issues are among the principal constraints on the viability or future usefulness of traditional marine management systems. Thus, if the contemporary usefulness of such systems has been formally recognized by government, they will require support by appropriate amendments to national fisheries laws, and lower order governments, such as provinces/states, with explicit and easily-understood recognition of customary law and community-based management rights as local corporate entities, accompanied by procedures for establishing the recognition of these rights. Other laws will probably require amending to recognize the authority of local legislative institutions, and so further validate the authority of (or to re-establish) traditional management systems (Bailey and Zerner, 1992). This is a very fruitful area for basic and applied research, both in policy design and research.

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SOUTH ASIA

BANGLADESH

There is little information available on traditional community-based fisheries management systems in Bangladesh. Skagerstam and Brattström (1991) mention them briefly for villages near Chittagong.

There, in general, inshore waters are strictly divided among villages. But the situation varies. For example, at the village of Rakhim Para, Kurushkul, marine waters are apparently under open access, except that first-comer's rights prevail to a fishing spot.

In contrast, estuarine waters are strictly divided. Eldest sons inherit these fishing areas patrilinearly. Fishing sites may be leased or rented to other fishermen. Similarly, at Ghorok Ghata, on Maheshkali Island, owned spots are leased for stake nets.

Inter-village conflicts over trespass in fishing rights areas, and intra-village gear conflicts, are mediated by the Village Council, composed of respected elders in the community.

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INDIA

A scattered literature reveals that traditional community-based systems of fisheries management are widespread in India. With the exception of a study by Mathew (1991), in Tamil Nadu State, most reports are highly fragmentary, and do not give a clear picture of management systems.

In a study of three small-scale fishing communities in the East Godavari, Visakhapatnam and Srikakulam districts of northeastern Andhra Pradesh State, Suryanarayana (1977) provides an outline of the fishery management system. The Pallae are the main people studied. They are both estuarine-riverine and inshore marine fishermen, although mainly the former. A similar - although undescribed - management system is used by the Vodabalija and Jalarie people of Visakhapatnam and Srikakulam districts. In the Pallae villages of East Godavari District community fishing territories have fixed boundaries for estuarine fishing. In contrast, coastal fishing is under open access.

Since fishing villagers are mostly all from the same caste, there is no senior caste that controls economic activities. Estuarine and riverine fishing is controlled by hereditary village headman (*pettandar*), the number of which depends on the population of a village. Villages are divided into groups of families (*mutha*), and each *mutha* is represented by a *pettandar*. Based on the total population size of the village, the *pettandar* collectively decide how many fishing rights ("shares") should be allocated to each *pettandar* for sale to the members of his *mutha*.

The first access qualification is residency in a *mutha* (which, since there is no out-marriage from the village, means a birthright). Qualification is also gender-based, since females cannot obtain fishing rights. The third access qualification to become a fisherman in the community is the purchase of a right (share) from the headman, for 10 rupees. Thereafter to maintain his status a shareholder (*rythulu*) must make an annual payment of 3 rupees. On that basis a father may obtain rights for a son, but until that son has become an independent adult fisherman, the father cannot purchase a right for another son.

The nature of the rights varies somewhat among villages. In Mullaetimoga village, for example, rights are not inheritable, and cease with the death of the holder. Nor are they transferable. In contrast, at nearby Pandi village, rights are both hereditary and transferable, and an official record is kept of them.

Each shareholder group, based on the *mutha*, exercises its rights within defined tracts of river and estuary. Equity of access among the members of the group is based on a spatio-temporal rotational system, with the *pettandar* deciding when and where fishermen may place their nets, and the turn they must take in the rotation.

However, there is apparently no system to ensure equity among villages. For example, the fishing territory of Kottapalam village is closer to the mouth of the estuary than is that of Mullaetimoga. Hence the catches made in the latter village, and particularly the valuable prawn catch, are far smaller.

Eleven types of net are used by the Pallae in river and estuarine fishing. These are two types of boat seine, two types of beach seine, five types of drift net, the casting net, and a stake or pound net. (Suryanarayana [1977] does not mention to which gear[s] the management system is applied.)

Also from the east coast of India, Raychaudhuri (1980) mentions the principal operational rule and mechanism for conflict resolution employed by stake net fishermen during their seasonal fishing

around Jambudwip Island, off the Ganges Delta, in West Bengal. The group studied were refugee professional fishermen from former East Pakistan.

The principal operational rule concerns setting the net. First-comer's rights prevail, in that no other group can set its net either in front of or behind the first-comer's gear, and so impede its catch either on the flow or ebb tide. Inter-group conflicts arise mainly from the infringement of this rule. When such a conflict arises, an informal committee (*panchayat*) of fishing group leaders and other respected fishermen is formed. This committee hears the evidence of both parties, and attempts to reach a compromise settlement. If agreement cannot be reached, both parties are taken to the site. There the movements of a log dropped in the sea are observed in detail. If it enters directly into the net set in front of another, the owner of that net must relocate it. The use of sites on the island for temporary fishing bases is also governed by the first-comer rule, in that a site cannot be appropriated by another fishing unit while the first group continues to use it. However, that first group forfeits its right to the site if it misses one season of use.

There are scattered references to community-based fisheries management in Kerala State, on the west coast. For example, it was observed that the economic importance of stake nets is demonstrated by the tax levied by the State of Kerala on the right to site these nets, and also because such rights were not uncommonly transferred as part of a dowry (Klausen, 1968).

Historically, fishing communities in Kerala enjoyed exclusive access to inshore waters. The free entry of capital and outsiders into traditional fishing communities was prevented by such social barriers as caste and the requirement to have fishery-specific skills (Kurien, 1991). Kurien (1990) observes that as a consequence of the shrimp-trawling boom in the 1980s, inshore fisheries in Kerala were *de facto* converted from being "... the exclusive preserve of traditional fishing communities who viewed the sea as their community asset... [to] a virtually open access resource to anyone who could afford to make the necessary investments in craft and gear".

In response to prawn trawling in Kerala, from 1979 inshore fishermen started a "socio-ecological" movement to reclaim their historical rights (Kurien, 1990). They did so by a programme of erecting artificial reefs. This programme was based on traditional practise and knowledge, since to increase their catches beach-seine fishermen had for generations dumped rocks fastened with coconut fronds in inshore waters 5-10 m deep. This traditional practise, in combination with the experience of greater catches taken by hook-and-line fishermen over sunken structures (such as ship wrecks) in deeper waters, provided the impetus for an artificial reef programme. Five construction initiative-user rights combinations have emerged during the years since 1980 (Box 1), although there is evidence of a convergence toward community use rights.

Lagoon fisheries for prawn and mullet in Tamil Nadu State of southern India are regulated by community-based traditional management systems known as *padu* and *talekettu* (Mathew 1991). The former depends on the latter, since to be a member of the *padu* a man has first to be a married member of the *talekettu*.

The *talekettu* system, used in some lagoon and marine fisheries north of Madras city, is a village organization based on caste and gender. Entrance is limited to male villagers of a particular caste if the Village Council confers eligibility on them. Eligibility depends on a candidate's skill level and acceptability to the village. When a potential candidate is about 15 years of age his father approaches the Village Council. If the boy is accepted his father pays an entrance fee. Membership of the *talekettu* entails the obligation to be responsible with other members for the common expenditure of the village.

(1) reefs constructed by an individual and fishing rights rented to fishermen. This was not entirely successful owing to problems of monitoring and prevention of free access;

(2) Group initiatives in fishing villages to construct reefs and limit use rights to the group members who bought shares to pay for their construction;

(3) group and external agency initiative and group use whereby which village cooperative members bought equal shares, which, supplemented by a grant from the South Indian Federation of Fishermen Societies, covered construction costs. Fishing rights were limited to the shareholders;

(4) group initiative and community use under which construction funds were collected from village households through the initiative of a committee, the members of which would accrue social prestige from so doing, in the same way that a village festival is financed. The reefs erected by this group initiative and to which the entire village contributed what it was able were open to all village fishermen;

(5) community initiative and community use in which the artificial reefs would be under open access but subject to operational rules regarding gear limitation, equitability of catch distribution and sanctions for those who infringed the rules.

BOX 1: CONSTRUCTION INITIATIVE - USER RIGHTS COMBINATIONS FOR ARTIFICIAL REEFS IN KERALA STATE

The *padu* (lit. "fishing site") is a traditional system of rotating access to a fishery whereby eligible fishing groups take their turn at specified fishing activities on an allotted fishing ground. In India this system is used by the marine beach seine fishermen of Tamil Nadu and the lagoon fishermen of Pulicat Lake. Although this is claimed as an ancient management system in Pulicat Lake, rights have been strongly asserted only since the early-1970s, with the development of an export market for prawns.

The system is open only to those married males of the *periya pattanavar* caste who are also members of the *talekettu*. The permitted gears are the long-used *suthu valai*, a fixed bag-net for prawns, and the recently-introduced *badi valai*, a drag-net for mullet. The *badi valai* is owned by the village elite, and the rights that are applied to it are far less egalitarian than those for the group-owned *suthu valai*. However, use of the *badi valai* has declined owing to changes to the lagoon bottom topography as a result of a 1984 cyclone, as well as to localized infestations of oysters.

Rights differ between the two gear types. For the fixed bag-net they are that only eligible fishermen can participate, the rights are group-, site- and species-specific, operating time is limited to 12 hours, frequency of operation is based on rotation of rights, and access is equitable for all eligible fishermen. In contrast, anybody can participate in drag-netting. Rights are owner- and site-specific only for the larger *padu*, but they are not species-specific. Operational time is 24 hours, with the frequency of operation depending on the number of eligible fishermen in the family owning the gear. Equitable access is ensured for all gear-owners.

In Pulicat Lake the *padu* system is applied to just three small fishing grounds, with a total area of 4.2 km^2, near the mouth of the lagoon bar. These three units are sub-divided, to facilitate allocation of fishing space among the three villages that are eligible to use them. Boundaries of the sub-divisions are not strictly demarcated.

The implicit function of the management system differs for the two types of gear. For the fixed bag-net the objective is to ensure equitability of access to fishing grounds, whereas for the drag-net it aims at equal opportunity for all fishing units in designated grounds.

The system functions differently for the two gear types.

For the fixed-bag net (*suthu valai*) equitability of access is guaranteed to the fishermen from the three villages by a lottery that operates independently in each village. The number of days of a year allocated to a village for use of a specific ground are known. On auspicious days the villagers gather, and supervised by the Village Council, draw lots to allocate the space among their membership. Lots are drawn by fishing groups (not based on kinship). The names of the groups and their allotted fishing grounds are recorded. The annual right of a group to fish on specified days for 12 hours, from 6 a.m. to 6 p.m, on a particular ground is inalienable. This right can neither be leased nor sold. Should a group be unable to fish on an allotted day, the *talekettu* of its village have the right to operate it for that day. Since fishing grounds are of unequal productivity, groups have to alternate between them on their consecutive allotted days, until the *padu* cycle is complete. Each village has an average of five fishing days per month. But because of unequal productivity of fishing grounds, each village has access to the best ground only once every 12 days, or for 30 of the eligible 120 days each year. Some groups will elect to forego their right to fish in the less-productive grounds.

The drag-net (*badi valai*) is a family-owned gear, and the number of turns for this gear on the *padu* grounds is determined by family size. Fishing is allocated by a lottery.

Pressures on the System

Demographic pressure has forced the introduction of further restrictions to the system since he early-1980s. Now entry qualifications to *padu* rights are strictly enforced, fishing grounds have been further sub-divided, and boat crew size has increased from two to three persons. Grounds are now saturated: there are 550 eligible fishermen in the three villages, but on any single day the grounds can accommodate only 168. Because of the intensity of pressure in one village, a shift system of fishing has been introduced, and the number of fishing days allotted per group has been halved.

Although the lagoon is now clearly overfished, no control or conservation measures are contemplated by the Village Councils, who believe that catch reduction is not caused by overfishing but by external factors, particularly adverse weather conditions, like cyclone and drought.

A further pressure on the system has been conflict since the 1930s with free-riding outsider marine fishermen who do not acknowledge the *padu* system. As a consequence, rights have been

PREREQUISITES FOR ACQUISITION OF FISHING RIGHTS

(A) Talekettu

(1) Village Residence
(2) Male Gender
(3) Membership of *periya pattanavar* caste
(4) Requisite skills
(5) Acceptability to villagers
(6) Payment of membership entrance fee

(B) Padu

(1) Membership of *talekettu*
(2) Fisherman must be married

RIGHT OF TRANSFER

No such right exists, either permanent nor temporary

DEFINITION OF FISHING TERRITORIES

Three territories defined and named, and sub-divided to facilitate temporal rotation. each of the three villages permitted to operate within them 120 days/yr

GEAR AND SPECIES RULES

Only the fixed bag-net (*suthu valai*) for prawns, and the drag net (*badi valai*) for mullet, are permitted

ACCESS RULES

(1) Village-based lottery to fix sequence of site rotation among eligible fishermen ensures equitable access

(2) Fishing permitted for 12 hours/day (06:00-18:00)

AUTHORITY

Village Council

SANCTIONS

BOX 2: TRADITIONAL TALEKETTU - PADU MANAGEMENT SYSTEM OF PULICAT LAKE, TAMIL NADU

conceded to outsiders. Conflict intensified with the growth of the prawn export market, during the 1970s, when, as a consequence of physical violence, the outsiders acquired more rights within the *padu* area. Then, in the late-1980s, the government resettled outsider fishermen around the lagoon,

and granted them rights within it. Local fishermen claimed that the government had no authority to grant rights within the *padu* area. This led to conflict and the deaths of nine fishermen. As a result the government intervened and forced the local fishermen to grant rights to the resettled fishermen allowing them 50 days per year of gill-netting. These pressures are exacerbated by landless labourers and dispossessed tribal peoples, who are also demanding access rights.

In response the local fishermen formed the "Association of Traditional Lake Fishermen of Pulicat" to uphold the *padu*. Their arguments against outsiders' rights are based on the moral axioms of caste and tradition: tribal peoples and non-fishing peoples are reminded to keep to their caste-based occupations, and other fishermen are asked to keep to their traditional grounds. An ultimate solution is sought in the Government granting title deeds to the traditional *padu* fishermen. However, the Government does not recognize the community-based control of access rights, and favours the introduction of a licensing system to control overfishing.

Thus external pressures, and particularly the market-driven commercialization of the prawn fishery, has led to outsiders demanding rights and to the undermining of the system. This case also demonstrates clearly that community-based management of access alone will not necessarily guarantee management of resources. It shows that limited access fisheries can also be over-capitalized and over-fished if intensity of effort is not also controlled.

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SRI LANKA

Although according to statutory law coastal fisheries in Sri Lanka are managed under open access, in many localities fisheries operate under locally-sanctioned systems of limited entry, based on socio-cultural barriers. Customary rights are limited to beach seines (*madel*), *kattudela* or *bandudela* (stake or pound nets) and *jakotuwa* or *akulwetiya* (fish weirs) (Atapattu, 1987). That customary rights have an important economic role in Sri Lankan coastal fisheries was demonstrated by Fernando (1985), who shows that differences in incomes among fishing villages can be attributed to whether or not their fishery is governed by a community-based property rights system. Those that are so governed invariably have higher incomes.

In such communities customary fishing rights are vested in the local community, and outsiders are neither permitted entry to the fishing grounds nor are they recruited as fishing labourers. However, the strength of this exclusion right varies. Among relatively recently settled fishing villages on the east coast, seasonally migrant fishermen were not denied access in villages where fishing was not well organized. Once the community becomes organized, however, outside fishermen are banned. Under the exclusion mechanism used, outsiders are not permitted to beach their boats or to anchor off-shore in a village's sea territory (Fernando *et al.*, 1985).

Although customary law has diminished and was overlain by Roman-Dutch law since the sixteenth century, with the impact of first Dutch and then British colonialism, customary law still plays an important role in managing coastal fisheries. Customary law relates to gear types, time of fishing, net hauling and drying, rotational use of fishing grounds, division of labour, sharing of the catch or proceeds of the catch, and the payment of tithes. So strong are the rights in the beach seine fishery, for example, that they sometimes form part of the marriage dowry (Alexander, 1977; 1982; Atapattu, 1987).

The articulation between statutory law and customary law varies. Where the latter consists of strong and precise management rights and rules that pass the test of immemoriality, certainty and reasonableness, it is generally upheld by the courts. As in the case of *Gurvey v Bastian 3 Lor. 161*, where the court stated that "the common law right of fishing in the open sea may be controlled by custom regulating the time and mode of fishing (Anon., n.d.).

But where custom is weak and the management loose, it has generally been overridden by the courts. In general they have been reluctant to uphold custom apart from that concerning the large and expensive beach-seine (*madel*) (Anon., n.d.). In one court case (*Fernando v Fernando 42 N.L.R. 27*), the customary procedure of limiting fishing in territorial waters (*paduwas*) adjacent to west coast villages exclusively to resident villagers was challenged by a fisherman who had been excluded. This customary right of exclusion was not accepted by the court, which regarded it as a loose arrangement that was not invariably followed. Therefore, as a custom, it failed for lack of certainty.

Socio-cultural factors, particularly caste and religion, also limit entry to fishing (Munasinghe, 1985; Atapattu, 1987). Fishing is done by groups of families having a common caste identity. In the west, southwest and south of the country it is done mainly by Sinhalese of the Karawa caste; along the northern coast Tamil fishermen belong to the Karayar caste; and on the eastern and north-western coast the fishermen are the Mukkuvas, of Indian origin.

Along the west and south coast the fishing population is predominantly Roman Catholic, a legacy of Portuguese colonialism. Thus the Sinhalese Karava fishermen are also Roman Catholics. The church plays a major role in the small-scale fishing sector in Sri Lanka: fishermen pay tithes to the

church, are often financed by it, and the village priest often has a major role in conflict resolution. In some villages, in addition to residence, membership of the village Roman Catholic church was a qualification for fishing in village waters (Anon., n.d.).

But, under pressure from labour shortages, and the resultant high cost of labour, formerly closed communities are beginning to admit outsiders as fishery labourers. With time, such persons become accepted members of the community and function as social bridges to other outsiders (Fernando *et al.*, 1985). It is premature to predict yet whether this will lead to the further erosion of the system.

Community-based management of a Kattudel (Stake/Pound Net) Fishery

This type of fishery occurs in the Negombo and Chilaw lagoons. In the Negombo Lagoon the stake or pound net fishery has existed at least since 1721, as is attested by deeds preserved in local Roman Catholic churches. The fishery might be older, dating back to the fifteenth century (Atapattu, 1987). The Roman Catholic churches in the fishing villages assisted the fishermen in organizing themselves. The fishery was controlled by the church, which also resolved conflicts in it. The church received 10 percent of the income from the fishery as a tithe (Atapattu, 1987). Nevertheless, some disputes were beyond resolution by the church and were settled by Ministry of Fisheries and Industries via the *Negombo (Kattudel) Fishing Regulations (1958)*, which restricted the operation of a *kattudel* in Negombo Lagoon to members of one of four village-based branches of the Kattudel Fishermen's Associations (KFA). The result has been that the traditional community-based management systems has been reinforced by statutory law, such that traditional rights are well guarded and entry to the fishery very tightly controlled. The principal characteristics of the system are shown in Box 3.

Community-based Management of a Mandel (Beach Seine) Fishery

In 1970-71 Alexander studied the beach-seine fishery in Mawelle, on the southern coast of Sri Lanka (Alexander, 1977; 1982). Large beach seines were introduced to Sri Lanka from Madras, around 1860. In Mawelle village they were introduced in 1890 by three brothers.

Beach-seining requires a large extent of unobstructed sandy bottom, in sheltered locations close to the shore. Because the local coast is protected from the force of the monsoons, unlike other areas in Mawelle, fishing is a year-round activity. Beach-seining is restricted by coastal geomorphology to a roughly 1 km stretch of beach, which is sub-divided into two fishing locations, the harbour side and the rock side. Each net normally has a permanent crew of nine men.

Fishing Rights

As descendants of the three brothers who introduced the large seine net to the village in 1890, Mawelle fishermen claim sole rights to fish in village waters, as a birthright. Rights are based on bilateral inheritance. Outsiders marrying into the village acquire rights through their wives, as part of the dowry. Any person with access rights was entitled to construct and use a beach seine. The number of nets was not limited. This was effectively demolished in 1933, when government legislation required registration and licensing of beach-seiners, and only those with a license were permitted to work off a given beach. The legislation also permitted sale of shares in nets to persons without hereditary rights in the fishery. In most areas where beach-seining is conducted today the fishery is controlled by one or two licensees, who own all the gear, take all the profits, and who employ the net crew on a wage basis. The old system, prior to 1933, remained in Mawelle because village elites were unable to gain control of the fishery.

Authority: Local Roman Catholic Church and Kattudel Fishermen's Association.

Acquisition of Rights: Patrilineal descent among villagers *only*. (Rights cannot be rescinded.)

Territory of Rights: Defined and named.

Village Territorial Rights: The access rights to named territory *padu* defined, as are exclusive rights by certain villages to specific territories.

Village Temporal Rights: The days on which a village may exercise its access rights to a territory are defined.

Sanctions: Only fines are imposed for infringement of rules.

Acquisition of Membership in KFA: Only two qualified persons permitted per annum.

Use Rules: Lottery held among eligible fishermen every six days in each village branch of the KFA to allot *padu* among them. Winner makes first choice of site and so on in turn among all members. During the first six months after their entrance to the KFA, new entrants can select their fishing territories only after all other members have chosen theirs.

BOX 3: COMMUNITY - BASED MANAGEMENT OF THE NEGOMBO KATTUDEL (STAKE/POUND NET) FISHERY

Rules

Given the average time of three hours needed for one fishing trip with the beach seine, a total of only 18 hauls/day is possible (eight from each of the two fishing locations). However, there were 99 nets in operation, thus demanding regulation of access to the water. A rotational system of fishing is practised, based on the following set of operational rules to ensure equal fishing opportunity:

1. All nets are named and the owner of each net knows the names of those immediately preceding and following his turn in the sequence;

2. The fishing area is divided into two fishing locations, the "harbour side" and the "rock side";

3. The fishing (net) cycle begins on the harbour side;

4. A net can be used at anytime during the day after the net immediately preceding it has been used;

5. The net with the dawn turn in either location must be used before midday or forego its rights.

Although this system of rotation does not ensure equal opportunity during a single year, over a longer period (*i.e.*, during the life of a net) is apparently does so. One net sequence takes about 105 days, which means that during a 4-year period every net will have been used in every month: at good and bad locations, times of day and seasons

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SOUTHEAST ASIA

INDONESIA

There are few well-documented examples of traditional, community-based marine resource management systems in Indonesia. Nevertheless, it is evident that traditional, community-based fisheries management systems have a long and effective history in many parts of the country.

Such systems have been noted and minimally described in parts of Sumatra (Schot, 1882; Snouck Hurgronje, 1906; van Royen, 1927), Kalimantan, Maluku, Irian Jaya (van der Sande, 1907; Galis, 1955), Sulawesi (Kriebel, 1919), Central Java (LeBar, 1972; Collier *et al.*, 1979), East Java (Kendrick, 1993), Flores (LeBar, 1972), and Tanimbar (Kolff, 1840; van Hoevell, 1890; LeBar, 1972; Polunin, 1982; 1984). There is no comprehensive documentation for Java or the Lesser Sunda Islands (Bailey and Zerner, 1992a).

In Eastern Indonesia, community-based fisheries management systems appear to remain widespread. They occur in Ambon, Maluku, the Kei Islands, and along the northern coast of Irian Jaya. Lineages held use and management rights to certain reefs on Tanimbar, and permission to use them had to be obtained from the *tuan tanah* ("Lord of the Land"). Among the Galela people of Halmahera, northern Maluku, villages had tenured fishing grounds. On Selayar Island, in the Flores Sea, sites for fixed gear were tenured, and inherited by sons (Polunin, 1984). In Irian Jaya, the Ormu and Tepra coastal communities, near the provincial capital of Jayapura, manage fishing rights and access via a combination of family-owned reef properties and village-controlled inshore waters (Krey and Marlessy, 1990). Outsiders who do not first obtain permission to fish in family-owned areas must pay compensation in marine products captured. Permission must be obtained from the village "sea master" (*tubwe*) to fish in village waters. Village rights are commemorated in annual ceremonies. Closures are implemented seasonally and for life-crisis rituals.

There is relatively little information from Western Indonesia. In parts of Sumatra, exploitation of seas adjacent to settlements was partitioned among guilds, and the Orang Laut of the eastern coast agreed about which groups were entitled to exploit defined off-shore grounds. In Sumatra, the *marga*, a central village with smaller satellite communities and large tracts of land, river, and coastal water (Hanson and Koesoebiono, 1979) was the institution that managed terrestrial and marine resources, by annually auctioning and renting defined areas to the highest bidder (Collier, 1979). Management was based on customary *adat* law. Off Tuban, Central Java, anchored floating markers identified the boundaries of village sea territories.

Today, local-community fisheries management systems are the exception, rather than the rule in Indonesia (Zerner, 1989a; 1989b; 1991a; 1991b; Bailey *et al.*, 1990; Bailey and Zerner, 1991; 1992a, b). But given their wide geographical distribution within the country, it can be hypothesized that formerly they were much more widespread.

Undermining of traditional management systems began with the consolidation of Dutch colonial power (Bailey and Zerner, 1991). Based on Dutch colonial legacies, fisheries administration and governance in Indonesia is centralized, and traditional community-based systems have no legal basis whatsoever. Traditional management systems (*hukum adat*) of small-scale fishing communities have no status under statutory law, since they are not recognized by the *National Fisheries Law* (*Undang*

Undang No. 9/ 1985).[7] Customary law (*hukum adat*) and community territorial rights (*hak ulayat*) receive no mention in fisheries statutes on management.[8] Further, apart from formal government organs, no community level institutions or leadership roles receive acknowledgement and authority in *Statute No. 5/1979*, the law which authorizes the structure of village government (Zerner 1991).

National policy is that all Indonesian waters are State property, to be managed centrally, through the provincial, regency and village offices of the Directorate General of Fisheries, for the benefit of the entire nation. This is tantamount to legally sanctioning an open access system nationwide, regulated theoretically - since it is practically unenforceable throughout the vast archipelago - only by certain technical considerations regarding gear type, vessel size and mesh limitations.

However, although statutory law does not explicitly recognize traditional community-based management systems, it does not assert that they do not exist. But the centralization philosophy, an integral part of the nation-building effort in Indonesia, is a major reason for the undermining of local management institutions: "Not only is the Indonesian state generally suspicious of local autonomy, it is actively involved in seeking additional revenues and export earnings" (Bailey and Zerner, 1992:10). The control of and rents extracted from marine resources is one way of achieving these goals. As a result, traditional community-based marine resource management systems are being undermined. In many areas of Indonesia local and fisheries officials uphold the statutory law of open access.

Traditional Community-based Fisheries Management in Maluku, Eastern Indonesia

Community-based traditional management systems remain widespread in the central and southeastern Maluku Islands (Bailey and Zerner, 1992b; Zerner, 1991a; 1991b; 1991c), where they are known locally as *sasi* (lit. "to witness"). The term *sasi* in Maluku can be equated with a ritually-sanctioned taboo or prohibition on the use of a resource of commercial or subsistence value to the community. *Sasi* institutions, rules and sanctions are locally varied, but are grounded in customary law (*hukum adat*) and community territorial rights (*hak ulayat*). *Sasi* in inshore marine waters may have initially regulated access to pelagic schools and only more recently have been applied to commercially important reef species (Bailey and Zerner, 1992b).

Territorial Definition

Community sea territories (*petuanan* in central Maluku, *bati* in the northern islands) are well-defined. They extend from the low tide mark seawards to the edge of the shelf around the islands. *Sasi* regulations generally cover only waters up to 20 m in depth, since surveillance, monitoring and enforcement would be impracticable at greater distances, and these are regarded as free of access.

(a) Physical Definition: Areas are defined with reference to prominent physical features, especially promontories delimiting a bay, and linked by an imaginary line. Some communities also claim use and control rights over submerged reefs (*negeri tengelam*, lit. "submerged country"), which may be several kilometres distant from the community.

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[7] This is in striking contrast to the Basic Agrarian Law, which does recognize and uphold community-based rights and customary law for agriculturalists.

[8] Ironically, Indonesian statutory law does recognize the traditional rights of other nations to fish within its waters while not recognizing those of its own small-scale fishermen (Zerner, 1991b)

(b) Ritual Definition: The boundaries also defined during annual rituals. The ritual practitioners and legal enforcers (*kewan*) make an annual pilgrimage to sacred sites (*kramat*), located at the heads of promontories, during which they ".... are simultaneously articulating boundary lines. Sometimes these lines are linked to trees, promontories, submerged rocks or other natural topographic features that serve as guides to the seaward boundaries of the *petuanan*." (Bailey and Zerner, 1992b). An area placed under *sasi* is marked with a physical sign (*salele*), and decorated ritual "trees" are moored at the seaward limits of a community's sea territory (Zerner 1991c; 1991d). Elaborate rituals are also performed when an area is placed under *sasi*, during which the ritual practitioner walks the boundaries of the terrestrial component of the territory, disclaiming sacred verses in ritual speech and blowing on a conch shell (Zerner 1991c, 1991d).

At Nolloth Village, on Saparua Island, a female and a male *sasi*, with distinct functions and associations, are recognized. For the female "big prohibition" (*sasi mai*) two canoes filled with fruit are set parallel, with their ends pointing inland and seawards. These canoes demarcate critical boundaries between two neighbouring community territories (Zerner, 1991). The male "little prohibition" (*sasi simanuwal*) governs particularly productive areas within the territory. These areas are marked along the shore with trees tied with a girdle of leaves. Formerly, these might have been marked by columns of chalk. Since 1980 the boundaries between adjacent village territories have been marked with permanent cement columns (Zerner, 1991).

Rights

In general, all villagers have rights to fish in their village sea area, except when it is under *sasi*, or governed by various sets of rules (*vide infra*).

Entry Rights

When a *sasi* is closed neither village residents nor outsiders may enter an area. Generally, the capture of migrant fish is open only to residents of a village. In some villages, however, outsiders may be permitted to fish for them. If outsiders wish to fish them commercially they must pay a fee (Zerner 1991c; 1991d). Thus there is a moral concept of rights (for villagers) and rights plus fees (for outsiders). Outsiders are able to negotiate entry rights for fishing and passage.

Rules

There exists an enormous variety of traditional community-based administrative systems in the Maluku Islands. Elaboration of such systems might be a result of commoditization, whereas relatively simple structures exist in a primarily subsistence economy. The wide variation in the regulatory systems and rules among villages in the region is probably a consequence of rapid change in the legal, political and economic spheres. But everywhere the principle resource regulated is trochus (Zerner, 1991c; 1991d).

(a) Species Rules

In many villages on Saparua and Halmahera islands, rules applied to different species are based on whether the species is regarded as a resident, or non-schooling fish, or migratory, or schooling fish. This is further qualified for schooling fish.

When tuna, for example, are observed within a sea territory, their presence is immediately reported to the *kewan laut* (the ritual practitioner for the sea) who goes to sea to examine the school. If he considers that the school is not yet properly formed, he immediately declares this species closed

(under *sasi*), which immediately prohibits any attempt to catch them or to enter the area where they are located. The *sasi* is opened when the *kewan laut* determines that either the school has formed or the tuna are about to depart.

Diverse rules and strategies govern the capture of resident species. Rules pertain to gear types, size regulation and the behaviour of fishermen. Other regulations specify ownership of the harvest area, the rights of harvesters, who has rights to direct financial benefit from the harvest, and the nature of contracts with external entities or individuals. Other regulations concern sustainability of the resource and economic viability of the fishery (Zerner, 1991c; 1991d).

(b) Gear Rules

When the *sasi* has been lifted, stringent gear rules still apply, in the interests of equity. Netting is forbidden, and a casting net may be used only from a boat. Further, only paddled boats may be used to pursue tuna. Since these mobile fishes are considered collective property, partly because they are temporary migrants, gear, time and location rules are applied in the interests of equity (Zerner, 1991c; 1991d).

To promote equity of access to the trochus harvest scuba equipment, affordable only by the rich elite, is banned. However, where the government controls the harvest and divers are hired to bring it in, scuba gear is permitted. In many places stringent minimum size regulations are enforced.

Spatio-Temporal Rules

Short-term temporal and spatial *sasi* restrictions were also imposed. For example, in order to secure a skittish school of fish, *sasi* would be declared until they had migrated to and settled in one area, where they could be captured easily.

The principal *sasi* regulation is seasonal closure of specified areas. This is announced by the (*kewan*) walking around the perimeter of the estate, as well as being sung, chanted or broadcast. Subject to other regulations, community members may fish an area only during the open season, and never while it is closed.

At Nolloth Village the principal time regulation on the trochus stock is the number of years between harvests.

Size Limits

Size limits are also imposed on trochus that can be harvested. On Saparua and Halmahera islands, for example, the minimum size permitted is 5 cm (three fingers' width).

Authority

The ritual practitioners (*kewan*), together with other customary officers and government officials, constitute the institutional framework for *sasi* and its regulation of fisheries. They are also responsible for monitoring compliance and apprehending violators. At Porto Village, on Sapuara Island, the administrative system is headed by the *latukewanno* (lit. "Lord of the Forest"), who is responsible for all resource use and environmental management in the forest and marine sectors of the village "estate". Monitoring and enforcement of regulations is divided by sectors: the *sinakewanno* handles the terrestrial sector whereas the *sarlattu* controls the marine sector. Assistants (*anakewanna*, lit.

"children of the ritual practitioner") implement the orders of the *kewan*, broadcast public information throughout the community, and monitor compliance (Zerner, 1991c; 1991d).

Sanctions and Punishment

Violators are punished by the village councils. Punishment formerly included public shaming, by binding the violator with the physical sign of the *sasi*, corporal punishment with a rattan cane, and, most usually, monetary fines. Nowadays monetary fines are usually imposed. In the past boats, gear and catches were confiscated. The sudden disappearance of material objects by confiscation was also believed to have been a manifestation of supernatural punishment in some communities (Zerner, 1991c; 1991d). It is believed locally that areas under *sasi* are supernaturally "witnessed" and protected by ancestral spirits (*saksi*), that punish violaters with sickness or death.

Change in the System

Such a system, in one form or another, is known from Dutch colonial records to have existed since the 1830s. But there have occurred significant changes over time.

Prior to the late-1960s, *sasi* was hardly applied to the marine environment, but rather to the commercial regulation of terrestrial products. For example, of the 109 rules in the 1870 rulebook of *kewan* regulations for Porto Village, only five related to the marine environment (Zerner, 1991c; 1991d).

In the marine environment, the general rule was that only local villagers have access rights to village waters. There were further rules governing species, gear and timing of fishing (*vide supra*). But, since the 1950s and 1960s, an external market in trochus and other shellfish has driven changes within the *sasi* system of marine resource management. At that time, scores of cash-poor villages and village governments seized the opportunity to profit from this new market by re-structuring the *sasi* system through new regulations.

The most fundamental of these was the issuance by village governments of their regulations to village sea space and their right to a percentage of the income generated from it. Thus the *sasi* was transformed from one of a common property for village residents when resources had no commercial value to one in which the local village government regulated activities in response to local market demands (Zerner, 1991c; 1991d). Thus external markets shaped internal property rights. In tandem with this, it was specified that the income from the resource was to be used for community benefit and not for individual profit.

Community-Based Management of Fixed Gear

Fixed gear is commonly subject to traditional ownership rights. For Indonesia, traditional community-based management of the *roppong* FAD device in inshore and deep (distant) waters off Mandar, Sulawesi and in the Makassar Strait has been described by Zerner (1989a; 1989b; 1989c; 1991a).

Roppong are anchored, bamboo-rafts that function as FADs to attract scad and tuna. Priority rights to a hitherto open area are established by successfully anchoring a raft, which gives its owner the concurrent right to sever the anchor lines of unstable rafts that drift and intrude on others, but only after consulting with the intruding raft's owners, boat bosses or capitalizers, and deciding on a solution (Zerner, 1991a). The fishing rights and right to the site belong to the founding family, as long as a raft continues to function.

Site-rights are defended vigorously, and in particular against commercial purse-seiners that attempt to lure the aggregated fish away with lights, in a conflict remembered locally as the "rock wars" (because rocks were hurled at intruders). Zerner (1991a) reports that off the Bulukumba coast of South Sulawesi these rafts are regarded as family heirlooms, and the sites are inherited. According to customary law, fish aggregated beneath a raft are said to belong to the raft's owner, whereas those elsewhere are unowned. This is not recognized by statutory law, according to which aggregated fish are not owned until either netted or dead (Zerner, 1991a).

But, in the Majene area, local regulations on the rights of adjacent owners failed to prevent overcrowding, overfishing and conflict. Despite regulating priority to sites, clear boundaries and minimum distances between rafts were not established. Hence there has been severe overcrowding in the fishery and greatly reduced catches have resulted (Zerner, n.d.).

The local traditional regulation of first-comer's rights to a fishing spot has been overturned by the courts. Zerner (1991a) describes one case where the crew of a first-comer's raft severed the lines of an intruding raft, and dispatched it to sea. The owner and crew of the first-comer raft "... were found guilty of intentional, wilful destruction of another person's property and fined under civil tort claims for damages caused by the loss of the *roppong*" (Zerner, 1991a).

The Majene court invalidated the customary practise as a custom that must be nullified and abolished. The court considered that the practise obstructed national development and would provide an opportunity for individuals to play judge and so threaten national stability. This decision both reinforced the national tendency toward open access in fisheries and deflated confidence in local rules and management procedures. It signalled the centralization of fisheries management.

Community-Based Royalties Systems

On Ambo Island, in the Balabalakang Islands of the Makassar Strait, Kalimantan, an indigenous royalties system has been employed for the last four decades to regulate the harvest of the marine resource-rich area, within about 3 km of the highwater mark. Fishing in deeper waters is free of charge. In principle, the royalty is 10 percent of the market value of the catch by weight taken by outside fishermen, but in practise the fee is negotiated and adjusted to circumstances. This provided a secure source of income for an otherwise poor area (Zerner, n.d.).

Four principal rules govern behaviour of the fishermen: all, both residents and outsiders, must pay the fee at the completion of the fishing and processing period; the village head must be informed of fishermen's intentions, especially if they anchor within the fringing reef; outsiders must carry a letter from their own village head stating their target species and target locations, and this must be surrendered to the Ambo village head; having reported to the village head, and indicated acceptance of the local rules, people are free to fish in Ambo waters. The fees collected by the village head are surrendered annually to the head of the Mamuju Regency, who determines the minimum amount that the islands must pay.

Although having worked well until the mid-1980s, the system is now apparently breaking down, since outsiders have been blatantly disobeying the rules. This has been encouraged by the official government policy of open access in fisheries. Further, since the local population administers a management scheme yet turns over 100% of the royalties to the Regency Government, receiving very little in return, they are becoming less vigilant. They bear all the management costs but reap none of the benefits.

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PHILIPPINES

There is extremely little documentation of traditional marine resources management systems in the Philippines, an archipelagic State with a diversity of cultures and rich fishing tradition systems, where such systems are to be expected. More detailed field research is likely to reveal the widespread existence of traditional community-based systems in the Philippines, since they appear to have been commonplace historically.

The coastal or "municipal fisheries" of the Philippines are operated under an open access regime. As established by *Presidential Decree 704* (also known as the *Fishery Decree of 1975*), "municipal fisheries" are those that use boats of 3 gt or less, or gears not requiring the use of a boat. "Municipal fisheries" operate in both inland and marine "municipal waters", the latter within 3 nm of the municipal coastline. The "municipal fisheries" of the Philippines are approximately equivalent to the artisanal, small-scale or traditional fisheries of other countries. In the Philippines, all other fisheries are known as "commercial fisheries" (Santos, 1980).

This situation has its origins in the colonial periods of both Spain and the U.S.A. Under the Spaniards, fisheries were for the welfare of the town (municipality) and were an open access resource, although private rights were leased to individuals, particulary for construction of fish corrals (Spoehr, 1980). The U.S. administration, by *Act 4003 Sect. 67 (1932),* authorized municipalities to grant exclusive fishing rights to concessionaires within municipal waters via public auctions, with the principal intention of generating revenue for the municipality. Where this did not occur, gear was licensed to derive revenue (Santos, 1980). However, the Supreme Court ruled that the auction of exclusive rights pertained only to stationary weirs (fish corrals), oyster beds or fry-collection, and that municipalities could not exclude non-resident fishermen who obtained a permit from the Bureau of Fisheries and Aquatic Resources (Kalagayan, 1991). But under the *Fishery Decree of 1975* the licensing authority for municipal waters was given to the municipalities.

Milkfish (*Chanos chanos*) fry concessions have been widely examined (*e.g.*, Smith, 1981; Chong, Smith and Lizarondo, 1982; Smith and Panayotou, 1987). The municipality, as the resource owner, grants to the highest qualified bidder the exclusive right to gather milkfish fry from municipal waters for a period not exceeding five years. Sealed bids are submitted annually on a designated date. Such concession fees comprise an important part of the income of many municipalities. In a survey of 35 fry grounds, milkfish concession fees represented an average of 13 percent of municipal income (Smith, 1981), and in the Western Visayan Province of Antique 21 percent of the income of the 15 municipalities is derived from such concessions. Several municipalities obtained almost half their income in this way (Smith and Panayotou, 1987). In small coastal municipalities this income is used to pay the salaries of municipal officials and the allowances of the Municipal Council (Smith and Panayotou, 1987). Fry collection is done by labourers who must sell their catch to the concessionaire.

According to early Spanish chroniclers, systems of community-based coastal and riverine fisheries management existed in pre-Hispanic and early-Colonial times, based on independent villages (*barangay*), around Manila and in the Tagalog Region of Luzon Island (Blair and Robertson, 1903-1909). Around Manila, villages claimed areas of river and sea that were defensible against neighbouring settlements (Francisco Colin, 1663, cited in Blair and Robertson 1903-1909). In the Tagalog Region village fishing territories could be used by outsiders on payment of a fee (Juan de Plasencia, 1589, cited in Blair and Robertson 1903-1909), and such territories could be bartered like other property (Francisco Combes, 1667, cited in Blair and Robertson 1903-1909). But, as Spanish

colonial rule intensified, the *barangay* was eliminated as an administrative unit, and their village sea territories disappeared with them (Lopez, 1985).[9]

However, it is evident that the tradition did not disappear entirely. There are several examples.

In the Lingayen Gulf of Luzon Island there is a *de facto* system of access restriction associated with traditional types of fish aggregation device (*rama* and *radar*), since the person(s) who established them have the exclusive right to fish around them (Galvez, 1991). Artificial reefs made of tires were introduced to the Agoo Municipality, in la Union Province, in 1981. Although fishermen from various villages assisted in their construction, those who were not members of the Agoo cooperative were prevented from fishing near them. Those who were allowed to work the artificial reefs had to pay a portion of their catch to the president of the cooperative.

At Quinlogan Village, a recently settled area on Palawan Island, fishing was historically conducted on an open access basis. But, with the arrival of migrants from the Visayan Islands, from 1960, concepts related to the national law of municipal fisheries were introduced. But, within the statutory law, local management rules have been introduced to regulate beach seine operations. This was introduced in the 1980s to allocate equitably access to the prime site for catching shrimp fry. Hitherto, operations were based on first-comer's rights, but crowding made necessary some kind of allocation mechanism. At the start of the season beach seine operators meet to allocate turns for all operators to the prime site. After the assigned operator has set his net, all others may set theirs, on a first-come basis (Veloro, 1992).

In San Miguel Bay, in the Bicol Region of Luzon Island, rights to fixed gear sites have been traditionally allocated to individuals by informal village resource managers *amoionadors* ("boundary setters"). These are mainly respected village elders well versed in the history of family claims to fishing sites. Their primary task is to regulate new entrants to minimize conflict with established gear (Cruz 1982; 1986). This has become formalized at the village level in more congested areas, where the *amoionadors* charge a fee for their services (Cruz, 1982), whereas in other areas their role is still informal and traditional. Elsewhere, municipalities regulate details of gear place to minimize conflict (Cantero-Pastrano 1955; Hart 1956).

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[9] But they were re-introduced during the Marcos era.

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MELANESIA

FIJI

The complex social organization of Fiji was based on a hierarchical kinship system consisting of *vanua* (tribe), *yavusa* (clan), *mataqali* (sub-clan or lineage), and *tokatoka* (sub-lineage or extended family) (Ravuvu, 1983). Each had a hereditary chief with almost absolute power. Land and adjacent waters were held collectively by the *mataqali* or *yavusa* under a complex tenurial system. Since Independence, in 1974, Fiji has adopted a Westminster parliamentary system of government while retaining the traditional system of chiefs. The modern and traditional systems are linked by village and provincial administrations. A Council of Chiefs, composed of the paramount chiefs, sets policy for general Fijian affairs.

In the marine realm, Fijians are traditionally inshore fishermen and gleaners. Apart from the more spectacular techniques, pre-Contact fisheries were poorly documented. Most routine fishing activities are done by women, whereas men are responsible for providing large quantities of fish for ceremonial purposes.

Nowadays, the traditional owners retain their inshore exclusive fishing rights, but the actual ownership of all territorial waters is held by the National Government (formerly "the Crown"). The legal question of rights and ownership is one of the most highly charged and potential divisive issues confronting present-day Fiji. Information on the topic is virtually inaccessible, and official opinion usually closely guarded. However, a reconstruction of the process leading to the present difficulties has been made from documents available in colonial and national archives (Ruddle, 1993a).

Rights Territories

As elsewhere in Melanesia, fishing rights areas (*qoliqoli*) are an integral part of a tribal estate (*vanua*) that extends in a wedge-shape from an inland central watershed seawards, generally to the upper margin of the seaward slope of the fringing reef[10]. Fishing rights areas extended from the high water mark to the outer reef. Areas beyond the reef were not always traditionally owned by the adjacent rights holding group.

In most cases such territories are in the marine waters directly adjacent to a village or group of villages. Also, in former times, because the continual warfare required people to live in fortified villages, most fishing occurred as near as possible to the settlements.

However, many tribal groups have exclusive use rights to territories located far from their adjacent waters. In some instances, rights to distant fishing areas are held in addition to those in adjacent waters. Most such distant fishing rights areas are associated with patch reefs or with island-studded shallows, and many are separated from the rights-holding villages by inshore waters belonging to other social groups.

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[10] The comprehensive term *vanua* essentially describes the totality of a Fijian community. Depending on context, it is used to refer to both a social unit and the territory it occupies, thereby expressing the inseparability of land and people, as well as to the supernatural world and worldview (Ravuvu 1983; 1987)

Boundaries

In most cases the lateral boundaries of a sea territory are defined by the projection to the fringing reef of the lateral watersheds of a group's landholdings. As usual, they are defined on the reef by such clearly visible features of reef geomorphology as patch reefs, reef holes or reef channels.

Acquisition of Rights

All Fijians inherit fishing rights as a birthright to the collectively-owned kinship land. The chief of the kinship unit had the powers of distribution. Full rights could be granted to immigrants, refugees and military allies.

Shared Rights

The sharing of rights areas between or among different *yasuva* is common, especially those in distant areas. Thus, on the southeastern coast of Viti Levu, just north of the Rewa Delta, a large area is shared by five groups (Kubuna, Batikasivi, Natodua, Mataisau, and Batiki). Sometimes a *vanua* will share rights in one area and maintain exclusive rights in another.

Such sharing has deep historical roots. For example, Native Lands Commission records of 1899 demonstrate that the *yavusa* Vusaratu, Serua, located on the southern coast of Viti Levu, shared their inshore rights area equally with the people of Tomasi of Serua, Manggumanggua and Korovisilou (Hornell, 1940).

Rights of Outsiders

Rights could be granted to neighbouring kinship units to fish at specified times and locations. Today such entry rights are granted, with the applicant making a formal request via the traditional *sevusevu* ceremony, that involves presentation of *kava* (*yagona*: *Piper methysticum*) root, *tabua* (whale teeth) and mats. Further, a portion of the catch had to be offered to the rights-owners as compensation.

However, the impact of the cash economy has had a major impact on such secondary rights formerly granted to neighbours. These have often been revoked since the fish were being caught for the market and not for subsistence. For example, for that reason the customary rights holder at Dravuni and Bulia, on the northern Great Astrolabe Reef, revoked the ancient agreement whereby Ono Islanders were allowed access (Zann, 1983). As a reaction, groups with historical secondary rights have been pressing for legal recognition of such rights, although such disputes are still resolved traditionally, through chiefs or at provincial meetings (Zann, 1983).

On Qoma Island, fishermen jealously guard their fishing rights area against outsiders. They are particularly wary of ethnic Indians, since they use gill nets which, on Qoma, can be used but rarely and only if permission has been granted by the chief (Veitayaki, 1990).

This has led to difficulties in the present. Villagers at Votua, which has the rights at the mouth of the Ba River, have demanded of ethnically Indian fishermen up to F$500 per annum for entry rights (Kunatuba, n.d.; Zann, 1983).

The law requires that outsiders fishing in customary rights areas must first approach the Native Fisheries Commission, which then instructs the District Officer, of the Ministry of Rural

Development, to obtain permission for the fisherman from the appropriate *mataqali*. This is the official procedure. But, because of the time it requires, it is considered acceptable for the fisherman to approach the *mataqali* directly, to obtain the letter of consent, which is then endorsed by the District Commissioner. The Native Fisheries Commission then issues a permit. Upon payment of an annual license fee to the Fisheries Division, permission for the outsider to operate is then given. It is an open secret that money changes hands during this process, although this is another sensitive topic.

Traditional Fisheries Management

In pre-Contact times the *yavusa* or *vanua* land-holding social unit usually held tenure over adjacent mangroves, lagoons and reefs, together with exclusive ownership of seafloor, water, marine life, and rights of passage. This is unlike land, the rights to which are held by the *mataqali* (Ravuvu, 1983; Fonmanu, 1991). There has been some confusion on this matter in the literature. For example, Baines (1989:288) observes that "Some published attempts to explain ... [sea tenure systems] reflect the author's inability to comprehend their complexities and nuances. An understanding of Fijian traditional marine tenure, for instance, is not helped by the erroneous basic assumption of Iwakiri (1983) that marine area rights follow land rights in being based on the *mataqali* social unit...."

Sea territories were defended to the death against outsiders operating without permission. In pre-Contact times boundaries were in a state of flux owing to conquest and changing alliances, population pressures, marriage, and adoption.

Traditional Authority

Throughout most of Fiji, a specialized fishing clan (*gonedau*) and in the Lau Islands *dauqoli*, the master fishermen or "marine resource managers" (Thompson, 1940) were specialist fishermen for the chiefs. They were members of the upper class who managed the fishing grounds, communal fishing activities and turtling. Communal fishing by women was managed by the wife or daughter of the master fisherman (Thompson, 1949).

Routine daily management is conducted by each household. Communal fishing and long-distance fishing were managed by the *gonedau* (or by the *dauqoli* in the Lau Islands). The *gonedau* remains responsible for imposing the 100-day fishing taboo following the death of a chief (Zann, 1983).

At present, the protection of customary fishing rights and management of fisheries in rights areas is done via a complex arrangement. Responsibility is essentially shared by traditional authorities and various branches of the National Government.

Fishing in rights areas is mainly for subsistence, although there is some small-scale commercial fishing to supply urban markets. Subsistence is controlled by the local chief. Both members of the rights-holding group and outsiders may engage in commercial fishing within a rights area provided they obtain an IDA (Inside Demarcated Area) license. However, members of the rights-holding group are exempted if fishing commercially from the shore with either a spear or line.

IDA licenses are issued by the Fisheries Division. However, before applying, a fisherman must first obtain a permit from the social unit in whose rights area he intends to operate. This is issued by the District Commissioner, if the tribal group consents. Thus the principal authority determining whether commercial fishing can occur is still the traditional authority of the rights-holding group, which both consents or not to commercial fishing and can set such conditions on the licensee as target species, permitted gear, areal exclusion, and conservation rules. However, no legal provision exists

for compensating the rights-holding group for harvesting in its area, although it is common knowledge that *sevusevu* or "goodwill" payments are made.

But this seemingly straightforward modern management of traditional rights areas is, in reality, highly confused and emotionally highly charged. A major confusion stems from the convoluted legal framework governing inshore fisheries. Further problems are introduced by the several institutions and agencies that are involved in fisheries management in Fiji. Among these are the Native Land and Fisheries Commission, District Commissioners (see above) and Fish Wardens.

The Native Land and Fisheries Commission is under the Ministry of Fijian Affairs and Rural Development. It is responsible for identifying, surveying and registering the traditional fishing rights territories, conflict resolution and protecting ancestral Fijian rights. Prior to registration of these territories, the boundaries established through the survey must be approved by each social group.

Fish Wardens, honourary officials appointed under the provision of the *Fisheries Act (1978)*, are appointed by the Minister of Primary Industry, usually following a request from a social group. Their task is to enforce the provisions of the *Fisheries Act* and ensure compliance with conditions attached to fishing licenses in their community's traditional fishing rights areas.

Sanctions

Trespassers were subject to physical violence and their catches were confiscated by the rights-holding villagers (Kunatuba, n.d.). Boats and gear are also destroyed (Zann, 1983). The situation is both grave and sensitive, owning to the legal uncertainty of owners' rights. For example, Zann (1983) reports that politically and traditionally important high chiefs were taken to court and charged with the illegal confiscation of a poacher's gear.

Traditional Conservation

Traditional attitudes and behaviour to land and sea have assisted in resource conservation, based on the spiritual affinity with the natural environment, as expressed in the terms *na qau vanua* (lit. "the land which supports me and to which I belong"), or *na vanua na tamata* (lit. "the men are the land").

Certain taboos protected marine animals and reefs. Of these probably the most important was the taboo on the consumption of turtles by commoners. But social factors, and particularly the need for large quantities for ceremonial feasts, may have contributed to the former over-exploitation of turtles (Zann, 1983; Kunatuba, n.d.).

Temporary fishing bans are imposed in certain areas to allow stocks to recover, especially on spawning fish. Live storage of excess catches was also practised (Kunatuba, n.d.). There were also 100-day taboos imposed after the death of a chief, as well as those associated with birth and marriage (Ravuvu, 1983).

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NEW CALEDONIA

New Caledonia remains a French colony, hence its inshore waters are managed both according to the traditional tenurial system of the Melanesian indigenous Kanaks and a superimposed European system. The two systems co-exist, and marine resource management incorporates elements of both.

However, the traditional ownership of maritime territories is not recognised by French law. This has given rise to a number of problems for professional fishermen (Europeans, Tahitians and others) who fish in an area with a permit from the Merchant Navy and Fisheries Service, but who fail to seek access permission from chiefs of the different territories they exploit. This has led to conflicts.

Literature dealing directly with Kanak fishing societies is limited, since there were no substantive ethnological studies of Kanak fishing prior to 1973 (Bensa, 1973; Teulières, 1990). Elements of the traditional marine resources management system have been described by Teulières (1990; 1991), and this section relies heavily on her two studies. Teulières' (1990) publication on the Nenema zone of Northwestern New Caledonia was the first study of the local management of marine resources in the country.

Most of the information presented here pertains only to the Nenema zone, a geographically, politically and linguistically self-contained area comprising eight autonomous "chiefdoms" (*kavebu*), traditionally the largest political and social unit. (The French Administration superimposed a system of "great-chiefdoms" over the traditional order. These often have no real social or cultural basis, but function rather as administrative groupings for local government.)

Fishing Territories

Throughout New Caledonia, lagoon waters are associated with the land-based domain, and are everywhere delimited and owned. Access to marine resources is controlled mainly though a tenure system, owned and controlled first at the level of the "great chiefdom" and then at the "chiefdom" (*kavebu*) level. As is common elsewhere in Melanesia, each chiefdom possesses a defined terrestrial and marine territory, considered as a single unit. The concept of a territory is expressed in Nenema as "the place from which one draws one's provisions": *na yalap* (*na* = a place; *yalap* = to search for food), to which is added as appropriate, *ni wi yak* (*wi yak* = salt water, *i.e.*, the sea) to designate "fishing grounds", or *ni daak* for agricultural areas.

Boundaries

The seawards limit of a marine territory is the seaward slope of the barrier reef. Territorial limits are fixed for each *kavebu*, based on such landmarks as peaks, stream mouths or capes, and by seamarks like submerged reefs, channels or reef passages. Seawards of the barrier reef there are no social controls on access.

Primary Rights

Primary rights are a birthright inherited patrilinearly. This inheritance is regarded as a temporary right to benefit from natural resources, a status that is conferred by the ancestral spirits who are the true proprietors. From this, it is held, inshore waters are not free, and that the inherited use right is conferred by genies and ancestral spirits. The right is not traditionally regarded as one of ownership.

Rights of Outsiders

Prior permission is required to fish in the territory of another chiefdom. This is rarely denied to fishermen from neighbouring clans, who generally may freely fish occasionally in exclusive rights areas, provided that they do not target the annually migratory totemic species (see below). Such secondary rights are rarely denied, since the *kavebu* are often linked by kinship, from which frequent exchanges of goods and favours arise in connection with ceremonial events.

Outsiders may be granted permission to fish commercially, especially for crabs and *bêche de mer*. A Kanak fisherman can usually fish unhampered another chiefdom, provided he is accompanied by a local fisherman. But this varies, as some chiefdoms impose more restrictions than others. The people of Yandè, for example, prohibit commercial fishing by members of neighbouring chiefdoms, reserving the resource for themselves.

But permission may be withdrawn from outsiders, as happened in Yenghebane in 1986, owing to the almost total disappearance of *bêche-de-mer*. The fishermen of Yenghebane feared degradation of the local ecosystem from overharvesting. They also observed that processing the holothurians near the fishing grounds, which involves cleaning the guts into the sea, poisoned fish. Although the Yenghebane do not themselves eat or harvest for sale *bêche-de-mer*, a ban was imposed on harvesting it in their area, which is now considered as a reserve, available only to the chiefdom should a future need arise (Teulières, 1991).

Traditional Authority

Traditional authority resides in the chief. This is supported by the belief that property rights are protected by ancestral spirits (*duee*), via bans or taboos, the infringement of which brings supernatural punishment, in the form of sickness or death, upon the transgressor (Teulières 1991). Ancestral spirits are manifested in certain totems.

Sanctions

The traditional system, which demands respect for the territory of one's neighbours, is still strongly observed among Kanaks. This is reinforced by strong and universal beliefs about the supernatural consequences of transgressing the rules of access to fishing grounds. For example, it is held that a fisherman who fishes without permission in another territory will not catch fish if seen by the people of that chiefdom. His sense of guilt at his transgression will probably result in his becoming physically ill. To overcome the sickness, he must seek the pardon of the chief of the *kavebu* in which he fished. It may be the chief or another representative of his own *kavebu* who must seek forgiveness from the offended *kavebu*, on behalf of the fisherman.

Supernatural proscriptions preclude any access to a few specified locations. For example, a certain part of the shore may not be used by fishermen (or anyone else) because it is believed to lie on the road used by the dead to travel to their underwater domain.

Traditional Conservation

As well as limiting access to the resource, social pressure influences how heavily resources are exploited, and the means used. Although the Nenema people did not traditionally manage intentionally to conserve, nevertheless they refrained from catching more than they could consume. Wastage was condemned.

Fishing is only to provide food. Overfishing has always been associated with commercialization, and with the resources that present economic opportunities, *e.g.*, crabs in the North and lobsters in the South. The stocks of crabs available in Nenema, particularly at Baaba, reached such a low point around 1965 that fishermen were obliged to travel to Balabio Island to catch commercially viable quantities (Rocheteau, 1968).

Certain fishing methods known to be destructive were not systematically used. For example, although stupefacients are used throughout New Caledonia, this technique was apparently not favoured by the Nenema people, who fear that currents would disperse the poisons too widely. Elsewhere, as at the Isle of Pines and Maré, the use of stupefacients was locally regulated by the chief, who authorized them only rarely, such as during famines or other similar occasions (Leblic and Teulières, 1987).

Traditionally, efforts were made to preserve favoured fishing habitats to ensure a continued availability of marine resources. Thus, for example, care is taken not to damage the animal's burrow when digging for mangrove crabs, and so to ensure its reoccupation. Elsewhere today, Kanaks (particularly those of Yenghebane and Tie) fishing commercially avoid working the same spots as fished on their previous trip. They will re-use them only as a last resort, if fishing is poor elsewhere. In addition, certain areas near a fisherman's residence are reserved to ensure a continuous subsistence supply of easy access.

Numerous clans (*yamevwuk*) have some form of relationship to a species of fish or crustacean, as a result of which it is not normally exploited commercially. This is a system of control over exploitation closely linked to the Kanak worldview.

The capture of certain species is traditionally restricted for reasons unrelated to resource conservation. Nevertheless, such restrictions may function to this end, especially if the species concerned are the targets of commercial fishing. For example, certain marine animals have a special totemic or other relationship with a given clan. They are often annually migratory species which migrate at a precise time and according to a known route, from the lagoon zone, that they occupy for most of the year, to spawning locations outside the reef. While migrating they may be found close to a part of the shore that they frequent only briefly on that occasion, subsequently returning to their original habitat.

In Taanlô two species are associated in this way with a particular clan. These are a rabbitfish, *aalaat* (*Siganus* sp.) and a trevally, *nok daalaak* (Carangidae). The first migrates at the full moon around November and the second around March into a basin in the lagoon. According to the fishermen of Poum, the arrival of the schools of rabbitfish draws other fish with them in their migration. The fish captured on these migrations are not destined for commercial use, because of their sacred nature. Their capture is apparently reserved for members of this clan only. In former times, these fish were caught in encircling nets (as they are today), but were protected from being speared. This is another consequence of their "special relationship" with the clan.

Other bans which appear to work somewhat differently also have a bearing on the capture of certain species. In Lifou, for example, turtles are reserved for the chief, and may not be captured without his permission. Each turtle captured must be brought to him. Since this often involves such a complicated journey, fishermen prefer to avoid turtling.

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PAPUA NEW GUINEA

In cultural and socio-economic terms Papua New Guinea, in common with most of Melanesia, is a complex and extremely diverse nation, as demonstrated by the more than 700 languages spoken in a nation with a total population of only 3.8 million people. Further, in great contrast to the very large literature on land use in Papua New Guinea, traditional marine management systems have barely been documented. But the tantalizingly brief references in a scant literature indicate a richness of traditional marine resource management systems in Papua New Guinea, and reveal the scope for further research and documentation.

Any summary of the situation in Papua New Guinea is made even more complicated by rapid change. Traditional rights were asserted in inshore waters to known resources in areas customarily fished. Deep water fishing was a rare occurrence but, when non-traditional resources of value are found in deeper waters, these then become claimed also (Anon, 1989). This has resulted from commercialization and commoditization. Essentially, traditional rights have been defined by the role of aquatic resources in the local subsistence economy. Where fish was not important to the local subsistence base rights may not have existed but, where it was a staple complex, systems of ownership and close defense of rights were the norm. Further, and problematical for documentation and registration, is that traditional rights and claims often do not exist until they are inquired about; also, previously unclaimed areas may suddenly become the centre of a dispute as a result of increased fishing pressure (Freilink, 1983a).

Given that situation, only a few of the recent main items of the literature on traditional, community-based marine resource management systems are summarized here in terms of (1) Specialized Fishing and Maritime Trading Societies and (2) Societies with Mixed Agricultural-Fishing Economies.

1. Specialized Fishing and Marine Trading Societies

Two good examples of such societies have been well documented, that of Ponam Island (Carrier, 1981; Carrier and Carrier, 1983; 1989) and the Trobriand Islands (Williamson, 1989; Tom'tavala 1990). A sketch of an example from the Murik Lakes Area of East Sepik Province have also been provided (Barlow and Lipset, 1984).

(a) Ponam Island, Manus Province

Ponam Island is small, agriculturally-poor, and heavily dependent on fishing and trading. It is located 5 km off the north-central coast of Manus Island. The system of marine resource management on Ponam is complex and unusual. It is composed of three main independent and overlapping elements: (i) ownership of reef and inshore marine waters, (ii) ownership of species, and (iii) ownership of fishing techniques (Carrier, 1981; Carrier and Carrier, 1983; 1989).

(i) Ownership of reef and inshore marine waters

Historically the waters around the island were divided into six concentric ecological zones. These are best developed in South Ponam (see below). Further, the island waters are divided into quadrants: Ponam North and South, and Tonuf North and South (South Tonuf waters are seldom fished). For both historical and ecological reasons, the pattern of water and reef ownership differs in each zone.

The simplest tenure pattern occurs in Tonuf North, where one clan owns all the waters as a single, undivided unit.

The pattern in Ponam North is more complex. There the waters and reef are divided in two ways. First, with one exception, the reef slope defines the boundary between those holdings which extend from the shore to the reef slope, and those which extend outwards from the reef slope. Second, waters within the reef are divided into six radiating blocks. Six different patrilineal groups own those blocks within the reef, and the one that extends beyond the reef is held by five lineages and a dying clan. Outside the reef, Ponam North waters are divided into two large blocks: one is held by one clan and the other is in dispute among three social groups. This pattern arose only in the early-1950s, with the commercial boom in trochus, which led to a rebellion against the paramount clans' sole ownership of the area, and the assertion of independent claims by the different patrilineal groups.

The most complex pattern of holdings occurs in Ponam South. There six concentric zones extend from the island shores. These are, successively, the sea grass zone, the clear sand inside the reef edge zone, the outer shoulder of the reef, the deep water of Seeadler harbour, the relatively deep reef edge of the Manus Island shore, and the sandy belt inside the Manus Island reef. Each of the six zones is divided into a series of blocks,.the seaward and landward boundaries of which are determined by the natural boundaries of the concentric zones, and the lateral boundaries which are marked by stones, coral formations, and the like. These blocks are owned by lineages and sub-lineages. A single group may own several geographically separated blocks. Only the productive parts of these zones are claimed: sections with sea grasses that attract turtles and, in deep areas, places were coral grows close to the surface and thus provides good angling sites.

(ii) Ownership of species

Owners of sea and reef areas do not have exclusive ownership to their tenured waters. Their ownership is strictly limited by two sets of countervailing rights: species ownership and gear ownership.

Some patrilineal clans own some of the species caught, regardless of the gear used to catch them and irrespective of where they are caught. The most important are those which form large schools: tuna, mullet and anchovy. Any expedition targeting these species must first obtain the owners' permission. Thus the water- and reef-owning group does not have the right to catch all the fish that inhabit its area.

(iii) Ownership of fishing techniques

Ponam Islanders distinguished between technique that are "on or of the sea bottom" (*lo has*) and those that are "in the sea but not on or of the bottom" (*hire has*). Sea and reef owners control the former but not the latter, and, apart from angling, anyone wishing to use such techniques must first obtain the permission of the sea-owners. However, if an individual obtains permission to construct a stone fish trap, once built it belongs to him and can be automatically inherited by his patrilineal descendants, without the need to seek further permission of the sea owners.

However, the bulk of the fishing on Ponam uses *hire has* techniques, over which sea-owners have no control. Some such techniques are owned by patrilineal groups, some are restricted to certain waters whereas other may be used anywhere, and some require the prior permission of the water-owner. *Hire has* techniques may be sub-divided into collective and individual techniques. Collective techniques belong to patrilineal groups and are restricted to certain waters, whereas there are three classes of individual techniques: free (open to anyone anywhere), semi-restricted (apart from certain

conditions, open to anyone anywhere), and restricted (always requiring the water-owners' prior permission).

(b) Trobriand Islanders

In the Trobriand Islands land, beaches and marine waters are claimed and owned according to different rules and principles. Land ownership is generally exclusive to particular matrilineages, and all garden lands are defined by fixed boundaries and named. Since in Trobriand society land determines an individual's wealth or social influence, outsiders desiring access rights must compensate owners. Beaches, however, are regarded as the communal property of each village, and can be used by villagers who are both clan- and non-clan members alike. In general, outsiders are not permitted to use beaches freely (but see below). In contrast, village claims to marine waters are less well-defined. Both living and non-living resources are claimed, whereas territories *per se* are usually not. There are, however, exceptions to this general rule (see below).

The nature of claims toward resources varies according to whether a village is predominantly agricultural or in fishing, whether exploitation is for subsistence or commercial purposes, and whether the resource being exploited is living or non-living. In villages that depend primarily on fishing, exclusive claims to resources predominate, whereas in primarily agricultural villages outsiders are given access rights for subsistence fishing. However, in both fishing and agricultural villages exclusive rights are claimed for commercial fishing: the right to make money from village waters is regarded as belonging exclusively to the villages. Whereas for living resources agricultural village grant subsistence rights to outsiders, neither agricultural nor fishing villages permit outsiders to extract sand, gravel and, especially, coral limestone. Rights to non-living resources are reserved exclusively for the villagers (Tom'tavala, 1990; Williamson, 1989).

Trobriand Islander claims to beach areas and marine waters are based on three principles:

The first is a "mother-right" (*toliuula*) that governs all aspects of Trobriand Society. According to this principle, all contemporary rights and privileges are traced in a direct line of matrilineal descent from specific ancestors (*tabusi*), who made the original claims to marine areas and resources, to the present claimants (Malinowski, 1926; Tom'tavala, 1990).

The second is that of inseparable and natural appurtenance, in that beach areas and inshore waters are connected to the land. In predominantly fishing villages, coastal water and the fish therein are regarded as an aquatic garden, because fish are exchanged with inland villagers for their yams and other agricultural products (Williamson, 1989; Tom'tavala, 1990).

The third principle is heritage and traditions relating to, and traditional use of, marine resources. This heritage and traditions are contained in a rich oral literature song and dance repertoire pertaining to the ancestral claims to, and use of, marine resources and ancient cultural relationship with the local seas. This oral literature is the basis of customary law that is used to resolve conflicts. Contemporary islanders use marine resources much as did their ancestors, thereby demonstrating a continuing of occupance and use (Williamson, 1989; Tom'tavala, 1990).

Boundaries

The extent of fishing territories claimed varies. For example, villages on the northern coast of Kiriwina, where deep sea shark fishing is predominant, claim waters as far as can be seen from the top of the tree on the beach. Most other village claims extend beyond the fringing reefs to where they traditionally fished by sinking hooks and lines. The villages on the northwestern, northern and eastern

coast of Kiriwina Island and the Vakuta and Sim'simla Islanders claim 2 - 3 nm from the coast. The west coast or lagoon villages of Kiriwina claim waters averaging about 6 nm from the coast. The claims of most of the lagoon villages overlap. Kevatariya village claims the most distant boundaries, at 11 - 15 nm from the village, but these are to patch reefs only rather than the waters *per se*.

Fishing Rights

In general, all beaches are owned according to the principle of adjacency to owned land by matrilineages (*tolipwepwaya*, lit. "land-owners"). Within a village they are regarded collectively as "village beaches" (*kwadewa*), and are available to all villagers for everyday use (Tom'tavala, 1990).

Trobriand Islanders unanimously claim special rights to inshore and nearshore waters. Maritime territorial claims are expressed by the term "*ma bolitasi*" (lit. "our seas"), where *ma* denotes rights of usage or exclusivity of title. The nature of the rights claimed is not clear, but ownership is definitely included. Ownership rights are generally vested in the villages as a whole rather than to individuals or matrilineages, although the latter does occur (Tom'tavala, 1990).

However, some instances of private ownership of reefs also occur. At Kevetariya, a large lagoon fishing village on the northwest coast of Kiriwina, ownership rights are asserted to reefs in and on the fringes of the lagoon. These villagers own the coral patches in the lagoon as well as the extensive reefs fringing the lagoon. The rights extend to 15 nm along the coast from the village and 10 nm offshore.

In that village sections of reef are owned either by individuals or matrilineages. Each claim is clearly delimited and recognized by the villagers, and forms part of the family inheritance. Because the reefs afford especially good year-round fishing, they are regarded much as gardens on land and are sometimes referred to as "yam houses" (Tom'tavala, 1990) or "our gardens" (Williamson, 1989).

Acquisition of Rights

Rights to resources and resource territories are inherited matrilineally in Trobriand Society.

Rights of Outsiders

Outsiders are given some rights to village beaches, such as congregating on them for trading with fishermen, for collecting coconuts during transit, or, to inland villagers, to use the beaches when bathing. Beach-owners assert their rights and demand payment from outsiders for removing sand and gravel for construction. Although the rights granted to outsiders are based on custom, these are now being scrutinized more carefully by beach-owners (or beaches even closed entirely) who increasingly suspect outsiders of using their beaches for commercial gain (Tom'tavala, 1990).

Trobriand Islanders do not generally enforce territorial exclusivity. For example, on a reciprocal basis, outsiders are generally allowed to transit, bathe and fish in these waters. The main reason is that voyaging is a fundamental traditional activity which, if restricted by exclusive rights claims, would severely hamper inter-island travel. Also the imposition of trivial rules which restrict movement or usage of one's resources indicates meanness (*piki*), considered a major sin.

But territorial exclusivity is enforced in some villages. The most striking example is when the Labai villagers fish for *kalala* (mullet). Labai Village, on the northwest coast of Kiriwina, is regarded as a principal source of the Trobriand Islanders', and so is especially important for keeping traditions and magic. This village is renowned for mullet fishing. Every few months, during calm seasons and

full moon periods, schools of mullet migrate into the shallow waters between the fringing reef and beach of Labai, en route to the estuaries in which they spawn. As the villagers prepare to catch the mullet, they forbid outsiders to enter their village or beaches, in accordance with the supernatural requirements of mullet fishing (Williamson, 1989; Tom'tavala, 1990).

In predominantly fishing villages, outsiders are permitted to fish if they pay for the right. Rates vary from 20 *kina* per day at Gilibwa, to 100 *kina* at Bwadela. At Siniketa a one-time licensing fee of 1,000 *kina* is levied for the right to collect bêche-de-mer (Williamson, 1989). Other fishing villages, especially Kevatariya, do not permit outsiders to fish in their claimed area.

The specifics of marine tenure differ according to the nature of the resources, the origin of the fishermen, the dominant economic activity in the coastal communities, and the objectives of the fisheries. The principal distinction is between edible and inedible resources. The former includes most nekton species, crustaceans, shellfish, and some seaweeds. Rights or access to edible marine resources depend on the origin of the fisherman. No regulations, apart from taboos on certain species, limit the fishing activities of village residents. Restrictions on non-residents vary by locality. In the primarily-agricultural coastal villages, unrestricted fishing for subsistence purposes is permitted to outsiders, whereas they would not be allowed to conduct artisanal or commercial fisheries. In the primarily fishing villages, unrestricted fishing by outsiders is not permitted. In some villages outsiders are required to pay monetary compensation - notices to this effect have been posted -whereas in others no outsiders are permitted to fish. In contrast, each village claims the exclusive right to make money from its resources, thus no outsiders are permitted to fish commercially (Tom'tavala, 1990).

Among the edible resources are those not commonly eaten, but which are important commercial fisheries, like bêche-de-mer, pearl oysters, green snail and trochus. Islanders assert ownership rights to these and, except for food use, outsiders are not allowed to harvest them. Villagers alone have the exclusive right to harvest these for artisanal or commercial purposes. In some villages, outsiders can exploit them on payment of compensation. The gathering of various non-living resources, like seashells, coral, sand, and gravel is exclusive to villagers. Outsiders are forbidden to gather these resources unless given permission, which sometimes requires payment of compensation (Tom'tavala, 1990).

Traditional Authority

Land and marine rights areas are controlled by the elder (*karewaga*) of a matrilineage (Tom'tavala, 1990). Beaches are held by village chiefs and headmen as trustees for the villagers (Williamson, 1989). On request, village heads grant access rights to outsiders. Village headmen also mediate trespass and poaching disputes between villagers. These have occurred at Kavataria village, for example, where separate tracts of reef are owned by individual families. Fishermen claim that they can recognize the species that inhabit their tract of reef, and so in the market at Losuia can identify fish that have been stolen from them (Williamson, 1989).

Sanctions

At Labai village, were an outsider to even accidentally enter the reef during preparation for mullet fishing, he would be killed (Williamson, 1989).

(c) Darapap Village, Murik Lakes Area, East Sepik Province

A very brief sketch of the traditional management system in this area has been provided by Barlow and Lipset (1984).

Boundaries

Boundaries to family fish areas are marked by stream courses.

Fishing Rights

Mangrove areas and streams running through them are owned by families.

Acquisition of Rights

In this village lacustrine and marine resource rights are vested in the villagers by residence and inheritance. Rights are of primogeniture and may be inherited from both parents. Persons may fish in the mangrove areas to which their parents have rights, even though resident in another village. Spouses may fish in the areas to which their spouses have inherited rights.

Rights of Transfer

Rights of transfer are not acknowledged, and rights may not be sold or given away.

Rights of Outsiders

Reciprocal rights are granted to inland people, in return for sago, as well as to off-shore islanders. The right of canoe passage is free to all residents, whereas outsiders must report at the first village and explain the nature of their passage.

Traditional Authority

Authority resides in the Village Council. Outsiders can fish in lakes and the sea with the permission of the Village Council. However, the senior person (either male or female) has the right to withhold access to his/her family's rights area. No areas are tabooed.

Sanctions

Infraction of another person's rights can lead to physical and verbal violence. Villagers actively prevent outsiders without permission from fishing in their rights area.

2. *Societies with Mixed Agricultural-Fishing Economies*

Fishing Rights Territories

Among the Tsoi-Tigak people of New Ireland Province (Walter *et al.*, 1986) and the Baining of New Britain Province (Turner, 1989) settlements claim ownership of the adjacent reef and its resources. There are no nested boundaries with an owned area, and no differential access rights (Walter *et al.*, 1986).

In the Delta of Gulf Province each village has its traditional fishing grounds located along the banks of larger rivers and their tributaries. Fishing grounds are often not adjacent to villages and sometimes fairly distant, owing to the relocation of settlements that nevertheless retain their original fishing territories (Frielink, 1983b).

Boundaries

Among the Baining, boundaries of village beach and sea territories occur where river or stream courses intersect the coast.

Sea territories of the Baining are not internally sub-divided.

Rights

Among the Baining, beaches and reef are owned by a village collectively and not by kin groups or families (Walter *et al.*, 1986; Turner, 1989). There are no differential access rights to village residents (Walter *et al.*, 1986).

Only residents of a village territory have an unqualified right to exploit its reef and beach. Men and women who have married out of a village, and now reside elsewhere, as well as their children, retain their rights to exploit natal village resources, but should first seek permission (which would never be denied) (Turner, 1989).

Among the Tigak, sea and beach adjacent to a village are the communal property of all villagers, who have free access to any part of the reef. There are no sub-divisions by clan (unlike land ownership), nor differentiation of rights among community residents (Otto, n.d.). Village co-ownership is based on the principle of residence rather than descent.

In Waganakai village, on the south coast of the Talasea Peninsula of West New Britain Province, inshore waters and reefs are owned in common by all villagers (Anon., 1989).

On the small island of Pak, located east of Manus Island, inshore waters and reefs are owned by clans, with patrilineal inheritance. Waters beyond the reef are open to all (Anon. 1989).

Owing to a low population, density fishing is only a low-level activity in the Delta of Gulf Province. Each village has its traditional fishing grounds located along the banks of larger rivers and their tributaries. Temporary camps are established for 2-6 nights duration at the fishing grounds (Frielink, 1983b).

Acquisition of Rights

Among the Baining of New Britain Province, primary rights are acquired by residence in the territory of a particular village, and not directly as a result of kin or other social ties, although residence will of course be affected by such ties (Turner, 1989). Virilocal residence is preferred (Walter *et al.*, 1986; Turner, 1989).

Rights of Outsiders

The rights given to outsiders varies. In pre-Contact times, fishing was limited to reefs and shallow water close to a village, partly because of warfare and partly because gear was limited to shallow water types only. But, with the advent of colonialism, the situation changed drastically. With the introduction of deeper water gears and the end of tribal warfare, fishermen ventured into the areas traditionally belonging to other villages, claiming access rights through kinship ties and marriage. This has occurred among the Tigak people of New Ireland province (Otto, n.d.).

Thus there has arisen a discrepancy between areas claimed as sea territories of the ancestors and those actually claimed at present. Sometimes ancestral areas are adapted to present-day demand, and village sea territories have been extended (Otto, n.d.).

With increasing commercialization of marine resources have come increased demands for closure and protection of marine territories. It is commonly claimed that villagers have exclusive rights to such sedentary species as trochus and bêche-de-mer, and that outsiders must seek permission to harvest such species. Fishing for subsistence is regarded as available for all, but that outsiders ought to seek permission first. Commercial fishing is the exclusive right of the owners of a sea area, and outsiders are always required to seek permission. However, the ease with which permission will be granted is perceived of as varying by geographical proximity: neighbours have no problem in obtaining it. However, the principle of reciprocity is always applied (Otto, n.d.).

Some villages in Lavongai and Tigak have established fees for fishing in their waters, although these are difficult to collect, since villagers are unable to pursue poachers. And the poachers invoke kinship relationships to avoid payment. Some catches have been confiscated (Otto, n.d.).

On Pak Island, east of Manus Island, islanders may fish without paying compensation in other clan waters, if permission is first sought (Anon., 1989). After obtaining permission from Waganakai leaders, outsiders may fish in village waters (Anon., 1989).

Elsewhere outsiders are refused access for any kind of fishing. This is the practise on Yule Island, where fishing is relatively important because agricultural land is scarce. There coastal waters are open to Roro-speakers, regardless of kinship or residence, whereas others are evicted if caught (Anon., 1989). Similarly, in the Delta of Gulf Province outsiders are refused access but, since the level of exploitation is low, disputes are few (Frielink, 1983b).

Traditional Authority

Village magistrates have been reluctant to hear disputes, since they lack instruction on how to deal with marine boundary disputes. Otto's recommendation was that the government should not draw boundaries, since this action would only provoke disputes (Otto, n.d.). However, local magistrates should be empowered to and guided in handling such disputes.

Traditional Conservation

In only a few areas of high human population density have inshore resources been depleted. This has occurred along the north coast of the Gazelle Peninsula, in East New Britain Province, where the excessive use of derris as a stupefacient, together with chlorine bleach and dynamiting, has killed reefs, as well as fringing reefs of the Bali and Witu islands of West New Britain province, and smaller islands in Milne Bay Province (Anon., 1989).

Nevertheless, a concern about fisheries conservation has been expressed by villagers in widely scattered parts of Papua New Guinea. On Yuo Island of East Sepik Province, for example, fish stocks are perceived to be declining as a result of overfishing. Shellfish (not specified), too small for consumption, are removed from their natural habitat and re-seeded near to villages, for use in inclement weather (Kainang, 1984). Similarly, because of observed depletion of stocks by the villagers, giant clams are relocated in specific areas in Bwaiyowa village, Fergusson Island, Milne Bay Province (Yamelu, 1984). In Maipenairu Village, on the Northern Gulf of Papua, small finfish and crabs were formerly returned to the sea (Frusher and Subam, 1984).

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SOLOMON ISLANDS

Solomon Islands is one of the two nations in the region to have conducted a survey of customary fishing rights[11]. The survey was conducted in 1985, at 43 locations, and the common elements of the customary fishing rights system were synthesized and described by Ruttley (1987). Despite the many weaknesses in the design and conduct of the survey, and the resultant information gaps, the information generated provides a general overview of the main characteristics of traditional community-based fishery management systems in Solomon Islands. However, because of the highly complex cultural variations in the country, the survey results provide only superficial information. To be of any practical usefulness, they require supplementing by in-depth, society-specific field research.

Territorial Definition

In Solomon Islands, as in other parts of Melanesia, the inshore marine waters over which a social group has control are not necessarily those adjacent to its landholdings, as was erroneously stated by Baines (1985) and Ruttley (1987). The situation is far more complex than that. In the Lau and Langalanga lagoons of Malaita Province, for example, whereas the "saltwater" people hold rights to reefs and marine waters the interior-dwelling "bush" people also hold extensive sea rights, including mangrove and estuarine tracts, as well as large tracts of land in the interior of the island (Akimichi 1978, and pers. comm.). In some localities, too, reefs belong to inhabitants of the interior and not to those owning the adjacent coastal land, as in parts of Rennell Island, (Collenson n.d.) and Marovo Lagoon (Hviding, 1990).

Although in Marovo Lagoon a group usually controls a substantial area of land, lagoon and barrier reef, some have large sea territories but only small land holdings, whereas others control large land areas in the interior of the island, but have no sea territory. As everywhere, this is a consequence of historical processes of settlement and migration. In the Marovo area, to escape the endemic warfare of pre-Christian times, the ancestors of the present-day "bush" groups hid in the interior, to escape the powerful coastal peoples. Thus the coastal groups could establish the primary rights over sea and reefs still held by their present-day descendants, most of whom continue living in the traditional villages of "coastal" or "salt water" people.

In the Marovo area, inter-marriage between "bush" and "saltwater" people has led to some influential marine rights-holders living among the interior "bush" groups. However, they still retain their primary rights in marine areas (Hviding, 1990). Thus it is erroneous to assume that a "community" on which traditional management is based always refers to a physically identifiable community, such as a village or the like. In Solomon Islands the "community" in which traditional management rights are vested is a descent-based kinship group, the members of which, as a consequence of personal factors like inter-marriage, or of the alternative economic opportunities brought about by national development, can be geographically widespread.

Whereas the exclusive claim to lagoon waters is unambiguous, the nature of rights in waters beyond the reef is frequently less so. In some instances it cannot be ascertained whether such waters form part of the customary exclusive rights area or whether they are merely areas open of access in which fishing is customarily conducted. In general, waters beyond the seaward slope are under open access, but some communities claim exclusive rights within them (Ruttley, 1987). In Marovo, for example, although waters beyond the barrier reef are regarded as belonging to the community holding

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[11] The other being Fiji

rights to the adjacent lagoon waters, strong claims are nowadays rarely exerted. Formerly, however, when traditional pole-and-line fishing was conducted for tuna, exclusive rights were enforced for several kilometres seawards of the reef. But these became irrelevant, during the 1970s, when trolling replaced pole-and-line fishing (Hviding, 1990).

Boundaries

Lateral boundaries are defined by extending seaward a group's terrestrial boundaries, often in a circuitous rather than direct fashion, to the outer slope of the reef, and sometimes to points beyond. Lateral boundaries are marked by such natural landmarks as prominent trees, distinctive stones, islets, stream-mouths, or reef channels. In the Lau Islands sticks and stone walls are erected on the reef as boundary markers (Collenson, n.d.).

In Marovo Lagoon, stone shrines to contain ancestral skulls are built on rocky islets of 2-4 m elevation in the barrier reef. These function as territorial markers, and knowledge of them is still used to validate historical claims to reefs (see below). There geomorphologically distinctive features of the lagoon floor, such as sandy tracts in an otherwise rocky reef flat, that manifest themselves in the colour and wave pattern characteristics of surface waters, are also used to distinguish between group territories (Hviding, 1990).

The method of calculating seaward boundaries varies; some are measured in terms of the distance from the shore at low water mark whereas others are measured seawards of the reef. A common measure is "as far as the eye can see", or when at sea, when certain on-shore features become invisible. When deep sea species constitute part of the customary catch, seaward boundaries extend further off-shore. For example, the shark fishermen of Temotu Province claim that their exclusive area extends for 12-20 miles out to sea (Ruttley, 1987).

In this fashion, in the Marovo Lagoon, roughly rectangular marine rights areas are delimited. Sizes are estimated to be from 20 to 170 km^2 (Hviding, 1990).

Fishing Rights

(i) Primary Rights

In most cases primary rights are the property of a descent group, usually the clan or lineage. Although a particular descent group has rights to a defined area of reef and lagoon, in settlements made-up of more than one clan or lineage residents generally share the rights of access and use. Such shared rights occur on West Bellona, Tikopia and Rennell Islands (Ruttley, 1987).

Sub-division among individuals occurs in the Reef islands (Allan, 1957) and on a family basis in Roviana (Allan, 1957) and Lau Lagoon, Malaita Province (Akimichi, 1978). In Tikopia, in contrast, the degree of exclusiveness of rights is but slight (Allan, 1957).

Exclusive versus shared use is related not only to the general significance of a marine area to a community but also to the value of the resources contained. The strength (from strongest to weakest) of exclusive rights by gear and resource is (1) areas for net or trap fishing, (2) areas for collection of commercial shells, (3) areas for collection of shells for making shell money, (4) areas for line-fishing or spear-fishing, and (5) shell-gathering areas (Collenson, n.d.). This is exactly the same as the degree of exclusiveness of interests reported for Lau Lagoon, Malaita Province (Allan, 1957).

In Malaita Province, for example, primary rights holders would exercise their exclusive rights to area types 1-3, above, but not to 4 and 5. In contrast, in Western, Isabel and Central provinces, except on Rennell and Bellona islands, no outsider may engage in any type of fishing for commercial purposes (Ruttley, 1987).

(ii) Secondary Rights

Secondary rights are generally just those of usage, usually acquired by marriage into a primary ownership group. However, in Marovo, they are generally inherited, but held in the area of a group with whom the individual does not reside. This is exemplified by the marine use rights of "bush groups". To exercise them, a fisherman is required to formally seek prior permission from the group leader (Hviding, 1990).

In Marovo a fisherman who has neither primary nor secondary rights must also formally seek permission from leaders before fishing. This is not always granted. When awarded, such secondary rights are usually both temporary and non-transferable. Compensation or "fees" have not traditionally been required (Hviding, 1990).

(iii) Rights of Outsiders

Outsiders are generally granted the right of passage but not necessarily that to fish within an exclusive rights area. Outsiders from neighbouring communities are generally allowed to fish within another's territory, provided that permission is first obtained. Frequently, this is limited to subsistence fishing only, and often some form of payment or catch-sharing is also required.

Settlers from other parts of Solomon Islands may acquire land rights, but their rights to adjacent reefs and customary fishing rights areas are either very circumscribed or non-existent. For example, settlers from Tikopia and the Reef Islands now residing at Mbanua, in Temotu Province, have no rights to the Mbanua reef, but, on obtaining permission from the chief, are allowed to fish within the exclusive rights area of the original inhabitants. Again, at Matimi, in Temotu Province, settlers from the Reef Islands have purchased land, but their ownership of that does not give them rights to the adjacent reef (Ruttley, 1987).

Acquisition of Rights

Primary rights are a birth-right inherited from either father or mother or both, depending on the principle of descent in any given tribe or clan. However, there have been instances of the purchase of primary rights, as by the inhabitants of Fanalei, in South Malaita. These people are settlers from the Lau islands (Collenson, n.d.).

Secondary rights are acquired by either husband or wife, on marriage into a group, depending on whether the group is matrilineal or patrilineal, respectively. However, universally, the children of an exogamous marriage inherit full primary rights.

Fishing rights are inherited as an integral part of all other rights and obligations entailed in kinship in a particular decent group. In Marovo descent and inheritance is cognatic, an individual inheriting group (*butubutu*) membership and associated primary rights to use and to control from the sides of both parents. (Thus an individual's rights could be held in four group areas, if all grandparents come from different *butubutu*). But other factors, especially a person's place of primary residence, intervene. Rights are normally strongest and most complete in the area of principal residence. They also tend to weaken if they are not actively used (Hviding, 1990).

The Right of Transfer

The right of transfer is apparently rare in Solomon Islands, as is to be expected from the Melanesian spiritual relationship with resources and places. For example, Marovoan groups derive their identity from the estate (*puava*) which they conceive of as being held through ancestral title, and so which cannot be transferred to outsiders (Hviding, 1990).

One example of the right of transfer occurred among the Olevuga-Gaubata tribe, on Florida Island, Central Province. There intra-tribal transfers, made in exchange for pigs, food or money, generally occur only in association with the transfer of adjacent land, with which the reef is linked (Ruttley, 1987).

Rules

Each rights-holding group formulates its own local rules regarding access to and use of its marine resources by both residents and outsiders. Generally, whereas the right of transit is open to all travellers, fishing, shell-collection and other use of resources are regulated, especially if commercial exploitation is involved.

Gear Rules

Gear rules are widely applied. For example, in the interest of sustainable resource use, some rights-holding groups in Marovo lagoon prohibit the use of gill nets, stupefacients, spearguns, and night-diving with flashlights. Blast fishing is forbidden by all groups. In many cases, with the exception of blast fishing, these techniques may be used by primary rights-holders but not by outsiders (Hviding, 1990).

Conservation Measures

Group leaders and resource owners temporarily close, by taboo, portions of their marine territory to both group members and outsiders, as in Lau Lagoon, Malaita Province, where each owner can prohibit all fishing for periods of 2-3 months (Akimichi 1978). Closures of several weeks are announced to permit accumulation of enough fish to provision a major group celebration. Longer periods are also common: trochus reefs may be closed for up to two years, to allow stock replenishment, and the taking of turtle eggs and nesting turtles in the Hele islands have occasionally been banned for a year or more (Hviding, 1990).

Marovoans believe the most important task of the resources "management team" (see below) is to ensure that the resource base is maintained for the sake of future generations. Thus resource conservation is now a key concern for most group leaders and their "management teams" (Hviding, 1990). Despite modern pressures, in Solomon Islands, as throughout Melanesia, this task is made easier by the intimate and spiritual association between peoples and their environments.

Traditional Authority

Three levels of traditional authority exist in Solomon Islands (1) senior decision-makers (chiefs, village elders), (2) reef owners, and (3) community- or group-leaders (Ruttley, 1987).

(i) Senior Decision-makers

The group constitutes the ultimate decision-makers, those concerned with the fundamental issues regarding adjudication and use of rights. Their principal decision-making role covers allocation rights to outsiders, authorizing primary rights holders to engage in commercial activities, and resolving disputes over rights (Ruttley, 1987).

Marovo society provides an example. There, resource management is headed by a senior male (*bangara*), the main trustee and spokesman for the group, assisted and advised by other "big men" (*palabatu*) and "keepers" (*chakei*) of the group. Such "management teams" formulate and enforce resource use regulations. The senior leader's position is generally inherited patrilinearly, although to assume that position a man must be of good character. Men generally remain as senior leaders until they either die or become infirm (Hviding, 1990).

Commercial fishing is commonly subject to the chief's authority, although this is not universal throughout Solomon Islands. In some cases it relates only to the collection of certain species of shellfish. For example, at Marau Sound, Guadalcanal Province, the chief's permission is required only for commercial harvesting of clams, and at Kia and Tatamba, in Isabel Province, it is required for the commercial harvesting of trochus. Chiefly control over commercial activities is common in Western, Malaita, Isabel, and Central provinces, whereas it is uncommon in Guadalcanal, Makira and Temotu provinces (Ruttley, 1987).

The imposition of seasonal and/or area closures is usually the role of the chief. This often takes the form of a taboo, and is generally done to allow stock recovery, especially to provide for the extra needs of a feast or other special event. This can also be the prerogative of reef owners.

(ii) Reef Owners

This group generally controls decisions regarding temporal and areal closures within a rights area, and restrictions on gear types and other fishing activities. This occurs at Lau lagoon, Malaita Province (Akimichi, 1978).

(iii) Community- or Group-leaders

These men make decisions regarding such communal fishing activities as trapping and the use of encircling nets (Ruttley, 1987).

Enforcement

In Marovo Lagoon, enforcement of regulations varies according to the degree of commercialization, and qualifications acceptable for an outsider to gain access at one time may no longer be valid shortly thereafter. For example, during the mid-1980s, when there were many small-scale commercial fishing ventures in Marovo, regulations concerning the access of outsiders, gear and species were generally strictly enforced. In contrast in 1986-1987, when there was little commercial fishing, regulations were less strictly enforced (Hviding, 1990).

Conflict Resolution and Sanctions

There are four principal types of conflict (Ruttley, 1987):

(1) infringement by either holders of exclusive rights or by outsiders of a taboo over a portion of the customary fishing area;

(2) fishing without permission in the territory of a neighbouring community;

(3) rival claims between individual exclusive rights-holders from the same social group or between two different social units to particular fishing grounds; and

(4) the incorporation of marine areas into disputes regarding adjacent land areas.

Disputes of types 1 and 2, which arise from breaches of customary law, are generally easily resolved by customary means. Such intra-village disputes as types 3 and 4 are generally resolved by the parties in conflict, supervised by their village leaders. However, the leaders of the different social groups will meet if disputes involve members of different clans or lineages. Several different types of local institutions are involved: public meetings, as at Buala, in Isabel Province; customary court, as at Olevuga, Central Province; or a "customary committee", as at Olevuga-Gaubata, Central Province (Ruttley, 1987).

In other cases resolution is attempted at a series of levels. At Aveta village, Utupua Island, Temotu Province, for example, a dispute is first heard by the group leader. If he fails to resolve it the chief intervenes. If he, too, fails to resolve the conflict, other group leaders and elders are requested to help seek a solution (Ruttley, 1987).

Customary law is backed by the national court system. If the former fails to resolve disputes, formal courts can impose a decision. Whereas some communities have switched entirely from the customary law to the formal court system for all disputes, as at Vangunu Island, Western Province, and Russell Island, Central Province, in other locations the means of resolution selected depends on the nature of the conflict, as in Malaita, Isabel and Central provinces (Ruttley, 1987).

Among the Marovoans, in settling disputes and validating rights, the relationship of a group to its marine territory is demonstrated by knowledge of ancestral skull shrines, placed on islets in the barrier reef, of genealogies and oral tradition, and of the nomenclature of the local marine and terrestrial environments (Hviding, 1990).

In Marovo Lagoon, the interpretation of secondary rights is a common cause of dispute. There, fishermen commonly interpret kinship links to maximize their access rights to the widest area possible (Hviding and Baines, 1992). Often this does not accord with a local "management team's" perception of the man's rights, whom they classify as an outsider. As a consequence, claims to primary rights may be re-defined as secondary entitlements, or a claimant of diffuse secondary rights might be regarded as an outsider, and instructed to seek permission properly (Hviding, 1990).

Sanctions

Traditional sanctions are generally imposed for infringement of customary laws. Sanctions include reprimands and gentle reminders to abide by protocol (Ruttley, 1987). In Marovo society, for example, public conflict and criticism and causing shame are avoided. There, when regulations have been infringed once or twice, the senior group leader of the offended group either directly or indirectly sends a letter advising that some unnamed people from the group to which the trespasser belongs have been trespassing, and reminding of the requirement to seek prior permission. But repeated trespass is made public and the offender shamed (Hviding, 1990).

More serious breaches of rules require compensation, in the form of pigs, food, shell money, cash, or the return of the actual resource taken (Ruttley, 1987; Hviding, 1990). Among the Marovoans the most notorious trespassers are ostracized. This is the most serious sanction applied (Hviding and Baines, 1992). Rights are neither withdrawn nor forfeited for infringement of fishing rights or rules (Ruttley, 1987).

For yet more serious offenses police help is sought, and offenders are sanctioned according to statutory law. This is done for blast fishing, for example, which is in contravention of both customary law in Marovo (Hviding, 1990) and statutory law nationwide.

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VANUATU

Under the *Independence Constitution (1980)*, all land and customary fishing grounds that had been alienated reverted to their customary owners, with whom they now reside (Government of Vanuatu, 1980a).

Marine Territories

Since villages are widely separated, sea territories are large. That of Eton Village, Efate Island, for example, extends for some 35-40 km on either side of the village proper (Fairbairn, 1990).

Boundaries

Legally, based on the *Land Reform Regulation (No. 31)* of 1980, the rights of indigenous customary owners of inshore waters extend seaward only to the seaward slope of the fringing reef (Government of Vanuatu, 1980b). However, many villages make claims for more extensive areas; some extending to the horizon and including sea areas between the reef slope and off-shore islands (Fairbairn, 1990). Eton Village claims that its sea area extends for 50 m beyond the reef slope, and at Eratap Village, also on Efate, villagers extend their claim by 100 m to embrace four small islands. Where villages on one island own land on a neighbouring island, they claim the sea area between the islands as, for example, those on Uripiv Island, the "home" island, claim the sea between it and Uriv Island (Fairbairn, 1990).

Taurakoto (1984) observes that, according to Melanesian custom, seaward boundaries in Vanuatu extended as far as a person could fish or dive for shells. Seawards reefs, in deeper waters, are not owned.

Lateral boundaries of sea territories are a seawards extension of terrestrial boundaries. Some are marked by large rivers. However, many lateral boundaries are imprecisely marked, and have given rise to serious disputes.

Fishing Rights

As a rule, villagers have exclusive and equal rights to use adjacent reef fishing grounds (David, 1990). In general, reefs and lagoons remain the common property of the villages, although there are individual ownership rights (Fairbairn, 1990). However there is apparently considerable diversity within Vanuatu. According to Taurakoto (1984), reef boundaries are determined based on where a person's ancestors landed on the island, or what rights they negotiated, and also on the area of land above the high water mark owned by a person.

In certain areas on Ambae Island, as well as in southeast Ambrym, the scarce reefs are minutely sub-divided, single coral rocks on reefs allocated to heads of families, trespass on which required payment of compensation. In yet other parts of the island access anywhere is free to all residents (Kenneth and Silas, 1986).

On Lelapa island all reefs were divided as the property of the six chiefs of the six villages on the islands (Taurakoto, 1984).

Whereas the ownership rights are clearly recognized, the precise geographical areas to which these rights apply are often unclear. Rights are most straightforward where authority is vested in a

single person, the village chief, who then controls the entire reef on behalf of the village. Ownership is also clear-cut in isolated locations.

Landowners have special rights in adjacent waters, including that to lease parts of their reefs, although this right is subject to the approval of the Village (or Area) Council and the chiefs. Such exclusive rights also include that to use areas close to land for such special purposes as mooring sites, construction of fish traps or the establishment of breeding areas for shellfish.

Acquisition of Rights

Primary rights of resident villagers are inherited (Taurakoto, 1984). Inland villages without primary rights to coastal waters gain access to fisheries through kinship ties in coastal villages, since the interior was settled by migrants from the coast. However, such a right may be either reciprocal, with coastal villages gaining hunting rights in the interior, or in return for a traditional payment of pigs, *kava* (*Piper methysticum*), taro, or other valued items (Fairbairn, 1990).

Rights of Outsiders

Neighbouring villagers are generally allowed to use fishing areas if they first inform the owning village and, generally, also receive the permission of the Village Council. Hitherto, such arrangement seems to have been reciprocal, although the practise is now rare.

Commercialization has now become a consideration in granting access rights. At Erakor Village, Efate island, all outsiders must now seek the permission of the Village Council and pay a fee. One outsider was harvesting *bêche-de-mer*, for which he paid an annual fee of approximately US$ 90, and another was harvesting trochus and paying an annual fee of about US$ 18 (Fairbairn, 1990).

Traditional Authority

There appear to be significant differences in local control and management of lagoon and reef areas (Fairbairn, 1990). However, they are generally controlled by the Village Council, composed of village chiefs and elders, and sometimes by an Area Council, made-up of leaders from several villages, and by the landowners. There is much blurring of authority, but usually the Village Council is the paramount authority, although the principal chief is often the dominant influence, especially if he is also a major landowner.

Enforcement is problematical because of the large size of village sea territories. Poaching is discouraged by the posting of public notices on adjacent land borders, and Eton and Erakor villages regularly use the radio to warn against poaching.

In almost every instance, the Village Council is the principal authority governing reef and lagoon use. It has the power to impose fishing bans, enforce government regulation, resolve conflicts with neighbouring villages, and grant access rights and other arrangements with outsiders. An Area Council has an important role in reef and lagoon management, particularly when the areas and interests of several villages are concerned.

Sanctions

Offenders are simply told to leave an area. Serious offenses are brought before the Village Council. Traditional compensation may be paid by the village of the offender, in the form of pigs and *kava*.

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MICRONESIA

COMMONWEALTH OF THE NORTHERN MARIANAS

There is no longer any traditional community-based marine resource management is this country. Formerly, village chiefs controlled community fishing. The use of village territories was limited principally to villagers, although outsiders could be granted rights (Thompson, 1945; Dugan, 1956; Souder, 1987).

On Rota Island mackerel scad (*Decapterus* sp.) were caught by chumming and netting. For this, each village had its own allocated fishing areas. Chumming fish across another fishing territory was a capital offense (Freycinet, 1824).

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FEDERATED STATES OF MICRONESIA

This nation will be considered under the heads of each three major islands or states, Yap, Chuuk (Truk) and Pohnpei (Ponape), and their Outer Islands. There is no information on Kosrae (McGrath and Wilson, 1987).

YAP STATE

The traditional fishing rights of Yap are among the most complex in the Pacific Basin, and this brief treatment can scarcely do them justice (Anon., 1987; Johannes, 1988; Smith, 1991). The supremacy of traditional rights is enshrined in the State Constitution for 12 miles seaward from an island baseline, "...a line following the seaward edge of the reef system..." (Yap State Code 18:27). Thus traditional leaders theoretically have total control over inshore waters, and the government is limited to intervening only for conservation and protection in the State Fishery Zone (Smith, 1991).

Sea Territories

The inshore waters are divided by village, in sections that extend from the beach across the lagoon and reef, into the high sea. Inshore water (*daay*) and stone fish traps (*ach*) formed an integral part of an "estate" that also included various types of agricultural land.

Lagoon waters are sub-divided and owned by particular families. They could engage freely in small-scale fishing, but communal efforts had to be sanctioned by the village chief. In Raang Village, extended families, usually from high ranking-estates, own and oversee all inshore fishing (Sudo, 1984). Traditionally, each family also a owned stone fish trap, although in Raang Village some have inherited several, owing to depopulation (Sudo, 1984). Many, if not most, stone traps are disused (Hunter-Anderson, 1981).

Boundaries

Seawards boundaries to exclusive rights fishing areas vary, although in 50 percent of the cases they extend to the drop-off, at beginning of the seaward slope, whereas a further 10 percent do not extend as far as the reef margin, at the seaward end of the reef flat, and 8 percent coincide with the seawards side of the reef margin (Anon., 1987). Boundaries in the lagoon are marked by channels or passages through the fringing reef.

RIGHTS

In a recent survey (Anon., 1987) three types of rights were documented: those acknowledged by villages claiming reef ownership, those claimed by villages outside of any reef-ownership claim, and those to catch flying fish. But, as noted by Falanruw (1991), the situation is more complex than that, with rights being held by villages or associations of villages, *tabinaw* (estates or households) and individuals to areas, habitats, sites, gear types, fishing methods, and species.

Traditionally, the individual Yapese fisherman was enmeshed in a complex set of rights and obligations. As Falanruw (1992a:9) describes his situation:

"Where he fished was determined by both the location and status of his village as well as the marine resources of the estate. How he fished was also determined by his social status, and [so] the methods available to him. When he fished was dictated not only by seasonal marine phenomena, but the needs of leaders, and experience of fishing specialists.... Then, depending upon the fishing method, all or some of the catch may have been used to fulfil obligations to higher ranking villages, or to his own trustee who may in turn have contributed the catch to fulfil their obligation to others. If the catch was for family use, the best of our fisherman's catch would be presented to the head of his estate. Finally, within his own immediate family, he gives his wife the fish of her choice. In return he was provided with the finest of his wife's produce from the land and obtains the favour of his elders who will someday provide his inheritance."

Acquisition of Rights

Long-term fishing rights have been acquired in a variety of ways. In most cases they have been granted to the present rights-holders by the village or family that originally held them (see below). Although in some cases rights are permanent, most are subject to revocation if associated rules are infringed (see below). Acquisition is normally by patrilineal inheritance (Falanruw, 1982; 1992a).

Transfer of Rights

Of 66 rights-holding villages and families surveyed, 40 percent had been granted rights in return for the performance of routine duties of specific services (Anon., 1987). Of these, 69 percent were granted for making repairs to houses of high caste families, 23 percent for the performance of routine (unspecified) duties and 8 percent in return for serving as undertakers. The second main method of rights acquisition, involving 17 percent of the cases, was through a catch-sharing arrangement between grantor and grantee. Such arrangements varied widely (see below). Third in importance was acquisition of rights in exchange for traditional goods, specifically sails, rope, clay pots, spears, hats, and combs. This occurred in 15 percent of the cases. In 12 percent of the cases rights were acquired through warfare. Other minor means of acquisition included friendship between villages or families (6 percent), marriage (3 percent) and sorcery (1 percent).

Loss of Rights

In some cases rights were subject to revocation. This could occur in 70 percent of the cases surveyed (Anon., 1987). The principal reasons for revoking rights were failure of the grantee to fulfil responsibilities to the grantor (47 percent of the cases), offending or failing to show respect toward the grantor (28 percent) and failure to honour the fish-sharing agreement (13 percent). Other, less-common reasons are failure of the grantee to seek the prior permission of the grantor when giving or selling fish to third parties (7 percent) and the use of unauthorized fishing methods (5 percent).

Rights of Outsiders

According to some sources, outsiders had no fishing rights, and access is strictly forbidden. This, however, seems to be in error, as only one of 66 villages surveyed would not grant rights to outsiders to fish (Anon., 1987).

Rights are granted to outsiders, provided that prior permission is sought from the rights-holders before fishing begins. For short-term use, permission must generally be sought from the village chief or elders. But, in most cases, permission can be obtained from any member of a rights-owning

family. In most villages it appears that permission can be granted by a range of villagers (Anon., 1987).

Rights to Habitats

Rights to fish in specific habitats were controlled (Falanruw, 1992a). In general, the prestige of a habitat increased seawards. Inshore habitats were the least prestigious and limited to the lowest social ranks, whereas the open ocean was the most prestigious and access rights to it were limited to the upper classes. Although there were exceptions, in general the lower classes had rights to use only rivers and tide pools, women and children were limited to reef gleaning and collecting in mangroves (Table 1).

Rights to Gear

The right to use specific gear was often specified in access rights that had been granted to users (see above). Gear rights differed by social class. For example, some members of the lower classes were restricted to using simple gear, like sticks and stupefacients in the riverine and tidal pool habitats to which they had access. Women and children could collect invertebrates near the shore and use a hook-and-line inside the reef. Hook-and-line was also open to other individuals. A method that employed mostly smaller gear was also available to individuals, including butterfly nets (*k'ef*), push nets (*manago*), small fish traps (*yinup*), bamboo fish traps (*sagel*), and stone fish traps (*ach*) (Falanruw, 1992a).

Table 1: Ranking of selected habitats by prestige level

Habitat	High Prestige	Medium Prestige	LOW OR NO PRESTIGE
Open Sea	X		
Lagoonal Holes	X		
General Lagoon Area		X	
Mangrove Channels		X	
Mangrove and Coastal Fringe			X
Rivers			X

(After Falanruw, 1992a)

Rights to larger gear and that which required a group to operate were vested in communities. These included large butterfly nets (*yerao*), stone fish trap and leaf sweep (*ruwol*), and many methods of net fishing (Falanruw, 1992a).

Prestigious techniques that required special rights were reserved for members of the upper classes. These included net fishing from canoes in deep water (*athing*), using hand nets from canoes to catch flying fish (*magal gog*) and trolling beyond the reef (*wayrik*) (Falanruw, 1992a).

Rights to Species

Particular rights governed the catching of flying fish. Not all villages or families had this right, and in most cases the right was qualified by catch-sharing rules. Thirty-six villages have rights to catch flying fish (Anon., 1987).

Most of those villages have a specific area over the reef seaward slope or drop-off area in which to catch flying fish. However, 30 percent did not have a specific area for catching them.

Catch-Sharing Rules

In many instances the transfer of fishing rights was accompanied by the requirement that the grantee's catch from the area transferred be shared with the grantor (Anon., 1987; Falanruw, 1992a). Many of the rights to fishing methods used by individuals carried the obligation to contribute the first catch to the overseer of the fishing area or method, to the trustees or to the village. When individual or special methods were used in the fishing territory of a higher status village, either the first catch or the portion of the catch had to be given to that village as tribute (Falanruw, 1992a).

Such obligations applied mostly to various forms of net fishing. In a survey of 36 instances of such rules, 72 percent applied to netting, 8 percent to line fishing, 6 percent to the use of stupefacients, and slightly less than 3 percent to each of spear fishing, trapping, the use of weirs, probing with a stick (presumably for octopus, although this is not stated in the source), and unspecified techniques (Anon., 1987). The allowed techniques were specified.

The amount of catch to be shared with the rights grantor varies considerably among the cases, from 100 percent to 1-2 percent, with further rules specifying the frequency of sharing, the species and sometimes the size of fish to be shared, and other details. Occasionally, where the use of more than one technique is permitted, those details are specified for each technique. Where 100 percent of the catch was specified, this is qualified by such riders as "when needed", "of larger fish", "of catch once a year" or "of first trip". Some such detailed rules specifying the percentage of one particular species (*e.g.*, "50 percent of humphead parrot fish" [*Bolbometopon muricata*]). Often they simply specify a certain percentage of any "preferred species" or of any "fancy species", a modern form of the traditional tribute.

Not all fish are suitable for use as tribute or to satisfy obligations entitled in rights. Those preferred for tribute comprise a class of fish that are taken mostly in the open sea using upper class techniques and which, in former times, were enmeshed in elaborate ritual prior to a fishing trip. These include green turtle (*Chelonia mydas*), blackfin needlefish (*Tylosurus acus melanotus*), marlin (*Makaira mazara*), wahu Scombridae), yellowfin tuna (*Thunnus albacares*), skipjack tuna (*Katsuwonus pelamis*), and humphead wrasse (*Chelinus undulatus*). Various mostly, but not exclusively, reef species are a multipurpose category that can be used as tribute, although they are not preferred. These include rabbitfish (*Siganus* spp.) unicorn fish (*Naso tuberosus*), seagrass parrotfish (*Leptoscarus vaigiensis*), butterfly fish (*Heniochus* sp.), rainbow runner (*Elagatis bipinnulata*), flying fish (*Cypselurus cyanopterus*), and mahimahi (*Coryphaena hippurus*) (Falanruw, 1992a).

Traditional Authority

Traditional fisheries management on Yap formed an integral part of the complex hierarchical social organization. Society is divided into some five social levels of villages. The principal administrative unit was and remains the individual village. Kin groups and villages were linked into

three paramount villages, each of which was linked with a village in another alliance. Each set of those villages had a network of ranked villages in its alliance (Falanruw, 1992a).

Marine resources were traditionally managed by various villages authorities, although sometimes one individual performed all roles. The highest, the village chief, exercised general supreme control over inshore waters. He directed community fishing activities. Particular fishing techniques were controlled from beginning to end by specialists. They led communal fishing outside the reef, and sometimes another person directed communal fishing in the lagoon. Yet another person was the magician who ensured the safety and good fortune of fishing, and other persons oversaw the distribution of the catch (Falanruw, 1992a).

In Yapese society, authority stems from the land: land is perceived of as the chief, and the man who inherits it serves as its voice. The basic social unit and traditional basis of land ownership is the *tabinaw* (lit. "one land"), which may be conceived of as an "estate" ideally including all important resource areas.

An estate in headed by the eldest male of a patrilineage. He is nominally in control of the estate. Inheritance was generally through the male line (Falanruw, 1982; 1992a).

Management Techniques

Fishing in some areas is sometimes banned to allow fish populations recovery (Falanruw, 1982; Johannes, 1988). Fishing grounds could also be closed following the death of a landholder (Falanruw, 1982).

Enforcement

Responsibility for enforcement of fishing rights and associated rules varies. They are enforced at the village or family level, as appropriate to the tenurial arrangement, and responsibility is often divided among different parts of a village sea territory.

Only in one of the 66 villages surveyed was enforcement the direct responsibility of the chief (Anon., 1987). In 54 percent of the cases enforcement is carried out by any villager or family member, whereas in 43 percent it is done by a specific family member or villager.

Sanctions

The severity of punishment meted out for infringing on fishing rights varies according to the seriousness of the offense and on the kinship relationship between the trespassing individuals and those trespassed upon. Fishing trespass is punished, whereas persons in transit through an exclusive rights territory are not even intercepted.

Fishing without prior permission is the most serious offense; however, its seriousness varies by gear type used. Net fishing followed by spear fishing are regarded as the most serious offenses. In contrast, people seen collecting shellfish and diving were often not intercepted, and only in some areas are they punished.

There are various degrees of punishment but it is not mentioned whether or not they are applied in gradually increasing degrees of severity, depending on frequency of offending. Trespassing net fishermen are subject to confiscation of nets and boat in 34 percent of the 66 village or family areas surveyed, confiscation of nets and boats plus arrest in 9 percent, confiscation of just nets in 4 percent,

confiscation of land and gear in 4 percent, and either confiscation of gear or of land in 4 percent. In one village nets, boat and land or reef would be confiscated. Trespassers in one village would either have their nets and boat confiscated or would be killed. The use of physical punishment seems to have been to increase the severity of the punishment depending on whether or not the trespassers complained. That is, the initial punishment was confiscation of nets and boat. Then, if the man complained, he would be beaten in 12 percent of the villages or, as in one village, drowned. In contrast, in 22 percent of the rights areas, no punishment would be meted-out (this may be a modern phenomenon). Also, capital punishment is probably no longer applied, although it sometimes was in former times (Falanruw, 1982).

Spear fishermen elicit milder responses. In 21 percent of the cases they are not intercepted at all, in 26 percent of the cases they are merely intercepted and told to leave the area, and in 10 percent they are just forced to ask permission. In 46 percent of the areas where punishment would be meted-out, trespassers would have their gear confiscated, in 7 percent they would also have their boat confiscated, in 7 percent they would face both gear confiscation and arrest, and in a further 7 percent they would also face a beating if they complained. In one village the punishment would be either a beating or confiscation of land, in another both land and gear would be confiscated, in another land or reef in addition to gear would be confiscated, and in another trespassers would be subject to just arrest (Anon., 1987).

Only in 40 percent of the village- or family-owned areas would shell collectors be intercepted. In 44 percent of those they would simply be told to leave the area and in another 37 percent they would be forced to ask permission. Only in one village would they be arrested, in another they would have their gear confiscated and in another they would either forfeit their land or be subject to a beating (Anon., 1987).

In most cases (90 percent), persons who are merely trespassing in an area, such as by diving, but who are not fishing, are not even intercepted. In four areas where they are intercepted they would be told to seek permission, whereas only in two villages would they face the confiscation of all gear (Anon., 1987).

Traditional Conservation

Overfished areas are demarcated by the placement of coconut fronds, which indicates that they are under a fishing restriction to outsiders, and closed for periods to allow the resource to recover. Sometimes area closures were also used to ensure a good harvest required to provision a future important event (Falanruw, 1992a).

Conservation practises were extended to the raw materials required to manufacture fishing gear. An example is the use of the seagrass *Enhalus acoroides*, which grows in only a few localities, and the fibres of which were traditionally used to make nets. Children were forbidden from playing in the seagrass beds and from pulling-up the grass. When harvested, only one leaf per plant was removed (Falanruw 1992a; 1992b).

THE OUTER ISLANDS OF YAP STATE

There is slight variation in the organization of fishing rights among the outer islands, but they vary significantly from Yap (Smith, 1991). In all the Outer Islands, marine resources are managed and controlled by the chief(s) for the common benefit.

(1) Ulithi Atoll

The atoll is divided into eight ranked districts, the senior of which is Mogmog, each with several villages. The lagoon and reef area is divided into 14 lagoon and 18 reef sections. Clan members have the right to exploit marine resources in those areas belonging to their clan.

The paramount chief of Mogmog has jurisdiction over the entire atoll. He originally allocated inshore resources among the clan chiefs of each district. They control marine resources on behalf of the paramount chief (Ushijima, 1982).

(2) Satawal Island

The chiefs of the three highest ranking of the eight clans on the island share resources management. Of these, the "Chief of the Sea" has the primary responsibility for regulating fishing. Men may fish anywhere near Satawal, whereas the women are restricted to fishing within the reef. More distant activities are more strictly regulated: remote areas and uninhabited islands may be exploited only with prior approval of the "Chief of the Sea", who has proprietary rights to certain species in those areas, together with the authority to decide on the timing and gear used in fishing there (Sudo, 1984). Certain areas, such as Wenimog reef, for example, are fished only on special occasions.

There is concern about dwindling reef fish populations on Satawal Island. There, fishing of one reef section is prohibited by taboo, to provide a breeding ground to supply the rest of the reef. The area was fished on authorized days only, which amounted to just five during a three year period (McCoy, 1974). However, since, unlike the reef fish, the behaviour of turtles is less well known to the Satawalese, conservation measures for them are more difficult, since their regular return has engendered a faith among the islanders that they will always return (McCoy, 1974).

(3) Woleai Atoll

The lagoon area is divided conceptually into segments, each under the guardianship of and controlled by a chief, who has the right to restrict fishing types and set taboos. Large coral heads separate from the fringing reef are named and owned by the clan or part therefor in whose lagoon segment they occur. The controlling social group also has the right to control the number of fish traps constructed in its segment (Alkire 1968).

(4) Etal Atoll

On this atoll, in the Mortlock Islands, reef flats and slopes are divided into small, named tracts owned by one of the eight clans or sub-clans who have exclusive fishing rights to them. Upon payment of a portion of the catch to the owners, outsiders may be granted access rights to use a reef section or stone fish trap (Sudo, 1984). The paramount chief has proprietary rights and can restrict fishing during times of food scarcity or to commemorate the death of a prominent man. District chiefs also taboo sections of the reef in the interests of conservation (Nason, 1971).

(5) Namonuito Atoll

On Ulul Island of this atoll one area is reserved exclusively for use of the chief's clan. All other islanders may fish freely anywhere else. The chief is responsible for fisheries management (Sudo, 1984).

CHUUK STATE

The reef flat and seaward margin of the reef are the main fishing grounds. These are strictly divided into named sections, each of which is owned and controlled for a specific lineage by a "senior man" (*mwaaniici*) (Goodenough, 1966). Rights in those sections are open to all villagers. In contrast, fishing rights on the seaward margin are open only to members of the lineage which owns that section. Several fishes must be presented to a section owned by another lineage by outsiders who fish in it (Sudo, 1984).

Subdivisions occur in the lagoon primarily as a result of fish trap construction. The person who constructed the trap has provisional title to the portion of the lagoon on which it is built (Goodenough, 1966). Rights to the use of a stone fish trap belong exclusively to the builder. If he transfers the rights to another person in the form of a "gift entailing obligation" (*niffag*), that person is obligated to give him fish from it each time the trap is harvested (Goodenough, 1966).

POHNPEI STATE

On the main island of Pohnpei, traditional marine resource management has died out since the end of the last century, when it was suppressed by the German colonists. At Pehleng village, Kiti Municipality, some 10 miles from Kolonia, the seat of government and main population centre, fisheries are now perceived of as being open of access, subject to the regulation of trochus, green turtle, the humphead parrot fish, and groupers by the Pohnpei State Marine Resources Division, under the provisions of the *Marine Resources Conservation Act* (1981) (Foster and Poggie, 1992). However, there is considerable enthusiasm among fishermen for reviving the traditional management system, based on each municipality, but without its former discriminatory aspects (Johannes, 1978).

Hitherto, each of the five municipalities of Pohnpei, through its chief (*nanmwarki*), had exclusive fishing rights in adjacent waters (Fischer, 1958). Municipal boundaries from the beach to the outer reef were marked, and coral piles were erected on the outer reef to show them (Fischer, 1958). Further, certain individuals within a municipality were able to exclude other persons, even those from the same municipality (Fischer, 1958). So severely were the rights enforced that sometimes sea travel was impossible. Trespassing sometimes led to warfare (Fischer, 1958).

There were also traditional gear limitations. It was taboo to use a net with a mesh size of less than "three fingers" (2.25-2.75 inches).

THE OUTER ISLANDS OF POHNPEI STATE

(1) Nukuoro Atoll

On this atoll informal arrangements and a day-to-day behaviour among families define a system whereby family ownership of reef waters is recognized. This system is not backed-up by traditional authority.

Foster and Poggie (1992) describe four such arrangements:

(i) *Dai made hale*, by which families have ownership of waters adjacent to their landholdings. The lagoon area is defined by a seawards projection of the lateral boundaries of a family's landholding to the outer edge of the reef slope. Fish within this area belong to the family. Outsiders may obtain secondary rights after first seeking permission.

(ii) *Hada gima* and *hada ba*, are "place for clams" and "place for oysters", respectively. Shellfish are collected within and outside the reef and placed in a *dai mada hale*. Each *hada gima* or *hada ba* is then surrounded in a circular fashion by rocks and shells from 2 to 6 feet in diameter. There may be several such places within a family's marine area. These may be owned by individual family members or may be shared with relatives who do not possess a marine area of their own.

(iii) *Mamunoa*, a marker (*baeao*) system, using anchored, floating coconut husks, to demarcate areas within the lagoon. Other fishermen may not fish within about 30 feet of such a marker. These often mark coral outcroppings (*manuea*) along the perimeter of the lagoon, and around which fish aggregate. Some fishermen deliberately attract fish to a *mamunoa* by chumming.

(iv) In former times, fishing activities were managed by a fishmaster (*tautai*), whose responsibility it was to teach younger fishermen, locate important fish stocks, lead fishing expeditions, and serve on the fishing committee. Nowadays, the title is used informally simply to distinguish the most highly skilled fishermen.

In the past, however, the *tautai* established the maximum length of line for bottom fishing (50 fathoms), and would cut the lines of those who infringed the rule. This rule is maintained today, informally among the fishermen. The spearing of lobsters was forbidden by taboo on Nukuoro Island (Johannes, 1978).

Group fishing is coordinated by a fishing committee, headed by one or more *tautai*, who are responsible for organizing gear, boats and crews, and, together with the elders, for dividing the catch among the community members. Only men of proven skill - equal to that of existing committee members - are eligible to join the committee. The committee establishes and enforces the fishing rules. Among such rules are:-

- Fish must always be chummed before fishing begins;

- to prevent poaching, neighbours must be informed before a family starts building a "place for clams" or "a place for oysters";

- when fishing for octopus the coral must not be broken, but a black sea cucumber is pushed into the octopus hole and squeezed so that it emits a sticky white substance. This enables easy extraction of the octopus without damaging its habitat;

- during night fishing for flying fish, lights may not be illuminated until the fisherman is 100 yards outside the reef channel, and without deviating, boats must follow each other in a single line, usually led by a *tautai* or other older fisherman.

Enforcement and sanctions are in the hands of the fishing committee. Those who violate rules are prohibited from fishing for a length of time that varies according to the severity of the infringement.

(2) Pingelap Atoll

Unlike on Nukuoro Atoll, there is no evidence that a system of exclusive access persists on Pingelap Atoll, although elements of a former traditional system of community-based marine resources management remain in the management by the *nahnmwarki* of spear fishing and trolling, the imposition of seasonal closures, and, for conservation, bans on the harvesting of species (Foster and Poggie, 1992).

Spear fishing inside the lagoon is prohibited seasonally when small bait fish enter the lagoon, and is replaced by bottom fishing in the lagoon or just off the seaward slope of the fringing reef. This is done to ensure that the larger fish that prey on the bait species will not be scared-off by spear fishermen, and that the period of their presence will be extended, thereby permitting a longer harvest period.

As a conservation device, spear fishing is also closed for a three-month period to allow recovery of reef species. However, such a ban may be lifted to permit fishing to supply holiday feasts. This includes easter week, *mwuongomwong* (the holiday marking the beginning of the breadfruit season) and *songomwuar* (the holiday marking the beginning of consumption of a new batch of preserved breadfruit).

Night trolling for tuna and other pelagics may be banned to prevent the scaring away of night-feeding pelagics. This is done to ensure easier and larger catches on the following day.

All fishing may be banned for two or three week periods to permit the bait fish known as *bokuta* (not identified in source) to become established, and so to attract the predators, which are the targets of fishing activities. Fishing is reopened once sufficient numbers of the target species are estimated to have arrived.

Several conservation measures are practised. The harvesting of small cowrie shells, depleted by the demands of the tourist trade, has been banned by the *nahnmwarki*. This will remain in effect until stocks are judged to have recovered. Men using casting nets (*deleia*) release undersized (4" and less body length) goatfish and *kolau* (*Acanthuris triastigus*).

Traditional authority is exercised by the *nahnmwarki* and his assistant (*penik*). The latter relays the *nahnmwarki*'s commands; for example, that to begin fishing after a closed period.

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KIRIBATI

Kiribati has a rich inshore fisheries tradition and lore that includes detailed local traditional rights and regulations. Many traditional management practices have been codified by island by-laws, and so incorporated into contemporary management.

Rights Territories

Clan lands usually extended as narrow strips across islands, from the ocean reef (*maran*) to the lagoon shore (*nama*), or from one ocean reef to the next, on reef islands, like Makin (Lambert, 1987). Sections of the adjacent reef were apportioned to rights-holding households. In the 1930s, on Beru Island, in the Gilbert Group, all lagoons were divided into a complex pattern of clan fishing rights, the boundaries of territories following lagoon floor contours and reef channels (Maude, 1977).

Boundaries

On Beru Island, the boundaries to fishing rights areas were marked with sticks (*rabu*) stuck in the sand of the lagoon floor (Maude, 1977). Boundaries between the rights areas of settlements were determined by prominent and named physical features. That between Betio and Bairiki villages, on Tarawa Atoll, for example, is designated by a distinctive, named rock formation, called *nei teba* (Teiwaki, 1988).

Primary Rights

Each *kainga* (clan; group of households living on the same plot of land) had its own plots of land and designated sea areas. A *kainga* in a village might have access rights to specified lagoon and/or deep sea areas, to which its members alone had exclusive rights of use or passage. Unless rights were held in other areas or permission sought, these were the only areas they could exploit.

Acquisition of Rights

Primary rights were obtained by birth into a *kainga*, and through subsequent inheritance. Rights are normally inherited by the eldest son of a *kainga* or *utu* (nuclear family), who, since he had equal rights to all other sons, was the "first among equals". Women were not usually given such rights, as they would marry into another *kainga*, where the husband would have rights.

Secondary rights could be acquired in the area of another *kainga* through marriage or through a gift. A woman could acquire fishing right through *tinaba*, a special category of gift bestowed to one who gave sexual hospitality to a close male relative of her husband (usually the older brother), uncles or *unimane* (village or clan elders) (Teiwaki, 1988). If a woman married a man who had no rights in his *kainga*, she would petition her brothers to allow him to join them in theirs.

Persons away from their home island could obtain fishing rights by a recitation and verification of their genealogy. Acceptance of such an account by the clan elders (*unimane*) enabled the claimant to take his sitting place (*boti*) in the meeting house (*maneaba*), and so to identify his relationship with others using the same *boti*. Those who had the same *boti* probably belonged to the same *kainga*, and so would have shared land and sea rights. The newcomer could then share these rights. This traditional practise is still observed in some outer islands, but is now rare in the urban periphery (Teiwaki, 1988).

Apparently, rights to unclaimed areas can be claimed by usufruct. Koch (1986) mentions that one family constructed a stone fish trap in the passage between Aranuka and Buariki, on Tabiteuea. Owing to the considerable labour involved, the exclusive use right of this family was not challenged, and the area is regarded as its private property.

Loss of Rights

Failure of a wife to petition her brothers on behalf of her husband who lacked sea rights would, if her husband fished, be regarded as poaching. If continued it would strain intra-familial relations and could result in the wife loosing her rights (Teiwaki, 1988).

Rights of Outsiders

Access to fishing grounds, reef channels, pools, and lagoon could be attained only through socially acceptable practises. Outsiders, like refugees or transitory residents, with no local traditional rights, could use other rights areas, traps or ponds after first obtaining permission from the rights owners. A sense of obligation made refusal rare (Teiwaki, 1988).

This is backed-up by statutory law: "fishing without authority in any sea, lagoon or on any reef forming part of an ancient customary fishing ground of any *kainga* is illegal" (*Kiribati Fisheries Ordinance,* 1978). This regulation was passed intentionally to protect native customary rights (Yeeting, 1988). The *Kiribati Fisheries Ordinance (1978)* protects traditional rights-holders by prohibiting the taking fish from any traditional rights area of a *kainga*, *utu* or any other social unit unless a license has been obtained from the Minister, who may grant or refuse it, at his discretion.

Rights to the Catch

The males of a clan were normally those who fished. They had the customary obligation to provision their nuclear family. Sharing of the catch within a family is culturally very important. Offspring are obliged to feed their elders; disinclination or failure to do so could lead to disinheritance, as enshrined in the *Native Lands Ordinance (1956)* (Teiwaki, 1988).

Rights to the catch, that express traditional notions of equity of access to resources, were embodied in the social norms and regulations governing the harvest of flying fish. In this fishery the use of nets was forbidden, because they both disturbed the fish and would unfairly disadvantage those who lacked nets (Teiwaki, 1988).

In purse-seining, within the lagoon, fish (or cash proceeds) are distributed equally among the fishermen when they are from different households. Owners of canoes and nets receive a larger share, to compensate for the use of their equipment. Reciprocal sharing of fish with other households is practised if catches are large.

The concepts embodied in the ownership of stone fish traps (*te-ma*) demonstrate an intricate pattern of reciprocal sharing and obligation in the construction of the trap and division of the harvest. Distribution of fish caught in stone traps is done by the trap owner, or his representative (who first consults with him). The catch size is estimated and divided into three lots: 75-85 percent goes to the owner of the trap and the owners of the coral blocks (*te inaki*) of which it is constructed. The remainder is given to those who assisted with the harvest. On Tarawa, as was customary, villagers are still allowed to harvest freely from the traps during the fishing season.

Traditional Authority

There was a considerable difference in the pattern of traditional authority structures between the northern and southern Gilberts. Authority in the latter area has been described as more democratic, being held by the elders of the meeting house (*maneba*). On those islands, land-owning clans also held tenure to adjacent reef and lagoons. In contrast, the social organization of the northern Gilberts was more hierarchical. There, one man controlled a large area of land and adjacent reefs and lagoons, the rights to which he dispensed to local clans (Zann, 1985; 1990; Lambert, 1987).

During the fishing season (*te ikabuti*), catching was controlled and synchronized by one person, the *te tia katau*, who, positioned atop a coconut palm, monitored the movements of the shoals and instructed the fishermen to start harvesting (Teiwaki, 1988).

Conflict and Conflict Resolution

Conflict results from trespassing on another clan's fishing rights area without first having obtained permission. Conflict occurred particularly over the location of rock traps, as in North Tarawa, where deaths resulted from the fighting that ensued. That conflict was partly resolved by the then British High Commissioner (Arthur Grimble; R.E. Johannes, pers. comm.).

Sanctions

Infringement of land and sea rights could be punished by death (Bate *et al.*, 1979). For example, on Tarawa Atoll, Betio villagers killed a fisherman from Bairiki for persistently fishing in their rights area (Teiwaki 1988). Monetary fines were imposed for breach of island fisheries by-laws (Teiwaki, 1988).

Traditional Conservation

There was no evidence of a traditional conservation ethic on Nonouti Island where, in places, the worm *Sipunculus indicus* is "being wiped out without a second thought" (Koch, 1986). Immature clams and other animals were also harvested and, occasionally, the reef is broken-up with a crowbar to extract octopi from their holes (Koch, 1986), thus exhibiting no evidence of notions of resource sustainability. However, in contrast, some inhabitants of Nonouti Island harvest immature clams (*Hippopus hippopus*) with the intent to transplant them to a more convenient site, where they are grown to harvestable size (Koch, 1986). On Tarawa, a common practise is to stock excess cockles (*Anadara maculosa*) near the shore for grow out and future use (Zann, 1985; 1990).

Fisheries Legislation

Most of the customary fishing rules of the islands of the Gilberts Group were embodied in the *Tuan Aonteaba* (*Islands Regulations*) of 1950, whereby different local fishing cultures would be reflected. Each island had different customary rules that regulated fishing methods, locations, seasonality, behaviour before, during and after fishing, and for distribution of the catch.

This legislation was repealed in 1967, when the Island Council system of local government was introduced, under the *Local Government Ordinance 1966*. Each Island Council henceforth was responsible for fisheries management, but their by-laws were subject to Central Government approval. Open access was now favoured by the colonial authorities. However, some Island Councils succeeded in having by-laws enacted covering their own customary rights areas, in particular those concerning

stone fish traps. For example, both Tabiteuea North and North Tarawa prohibit fishing or sailing within one mile of a fish trap during the fishing season.

Island Councils have been responsible for introducing conservation regulations. In particular, they have restricted the introduction of modern gear regarded as harmful. For example, several councils, like that of Tamana Island (Lawrence, 1977) have prohibited the use of pressure lanterns to lure flying fish when dip netting, since these are more effective than the traditional coconut frond flares; monofilament gills nets have been banned on several islands (Tikai, 1980); and steel-hooked or imported lures used in tuna fishing, which reportedly damage the jaws of fish that escape, are banned on several islands (Lawrence, 1977; Tikai, 1980; Kearney, 1983). Catch size and fishing times have also similarly been restricted. A catch limit on flying fish was introduced off Ukiangang by the Butaritari Island Council (Sewell, 1976).

Other local regulations are aimed at promoting orderly fishing as well as protecting fish schools. At Ukiangang Village, Butaritari Island, during nocturnal spring tides, reef gleaners must work in groups and not singly, lest the lights of earlier gleaners scare the fish. The lanterns of those who break the rule are smashed (Sewell, 1976); on Onotoa Island luring flying fish with flares was prohibited when schools of *Caesio* sp. entered the lagoon, since they are disturbed by them (Banner and Randall, 1953).

Other regulations promoted orderly fishing and equitable fishing. In the southern Gilbert Group for flare fishing of dip netting for flying fish at night, the number of canoes in a line was limited, and the position of canoes was changed in a specific order; thus all fishermen could share equally in the best spots (Zann, 1985; 1990). On Tamana Island, disturbing a feeding tuna school by dropping a paddle, releasing a fish or letting a pole tip touch the water was a severe offense. Originally the offender could be banned from fishing for a season or have his canoe wrecked. These days milder punishments are enforced by a $20 fine or a maximum of six months imprisonment (Lawrence, 1977).

The *Local Government Ordinance* 1966 was repealed and replaced by the *Local Government Act* 1984. Among the functions the 1984 Act empowered Local Government Councils to perform are those to develop and manage local fisheries, and to pass conservation regulations by restricting gear type, fishing techniques, fishing hours, area closures, and fishing behaviour.

The Local Government Councils of each island recognize the traditional ownership rights of village, clan or family head, and punish breaches of them (Tebano, 1992). They manage inshore fisheries, which are not regulated by the Central Government (Tebano, 1992).

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MARSHALL ISLANDS

The principal source of information on traditional community-based marine management systems in the Marshall Islands is Tobin (1952, 1958). Unfortunately, he mentions them only briefly.

Traditional systems of community-based fisheries management continued until 1934, when the Japanese administration declared all waters below the high water mark to be Japanese government property. This was continued under U.S. trusteeship, and is now generally accepted (Tobin, 1952). However, the rights to resources on reefs surrounding an atoll are still regarded as the prerogative of the inhabitants of that atoll (Tobin, 1958).

Throughout the Marshall Islands the paramount chief claimed productive reefs as his personal property (Tobin, 1958). Rights to other areas belonged to lineages who owned the adjacent land (Tobin, 1952). The seaward extent of rights for commoners was usually to waist depth, where a person could stand to fish with a pole.

Sanctions

Infringement of the rights of the paramount chief was punishable by either death or expulsion of the offender from his land.

Traditional Conservation

Uninhabited islands and their surrounding reefs were used as reserves, harvested only when specified by the chiefs (Tobin, 1952).

According to Johannes (1981), on Likiep Atoll, customary law forbids the consumption of predatory species that beach themselves while pursuing prey into shallow water. Rather, they must be returned to the sea, so that they continue to drive prey into the shallows, where they can be gathered easily. This is a rare conservation measure, and has been recorded also for Palau (Johannes, 1981).

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PALAU

In Palau, the traditional community-based marine resource management system has slowly eroded since the Japanese administration formally appropriated the area below the high water mark. These rights were reinstated and protected under the *U.S. Trust Territory Code* (Title 67) of 1970, which further noted that "Nothing ... shall withdraw or disturb the traditional ... right of the individual, clan, family, or municipality to control ... marine areas" (Trust Territory Code 1980:179). Regardless, old family tenure rights are now ignored (McCutcheon, 1981), traditional rules are flouted, the traditional conservation ethic largely abandoned, traditional authority ignored, and poaching widespread (Johannes 1981, 1991; McCutcheon, 1980; 1981).

Fishing Rights Territories

Each of the 16 formerly autonomous village-state clusters (*beluu*), formerly municipalities and now States, has the right to limit access to its fishing grounds. In one State, Ngaraard, waters were sub-divided to give each individual village control of the adjacent sea territory.

Boundaries

The seaward boundary of rights areas is the seaward slope of the reef. Exploitation of the open sea (*ngoaol*) was free to anyone, and the area was considered neutral, as exemplified by the custom of travelling past enemy villages outside the reef (McCutcheon, 1981).

Until about a century ago, when deep sea shark fishing died out, the theoretical seaward limited coincided with the outermost foraging limit of seabirds resident on Palau, some 75-100 miles offshore (Nakayama and Ramp, 1974).

Lateral boundaries of tenured inshore waters are an extension of State lateral boundaries to the seaward slope of the reef.

Fishing Rights

Subsidiary rights of individuals of corporate kin groups (*kebliil*) for fish traps or to particular fishing areas formerly existed within tenured areas (Johannes, 1981; McCutcheon, 1981). But these have lapsed and are now barely remembered (McCutcheon, 1980; Johannes, 1988). Temporary usufruct to *delachel* (lit. "place for putting something"), vested in the individual, lasted as long as the trap remained in place.

Acquisition of Rights

Primary rights are acquired through matrilineal inheritance. Persons affiliated with a corporate group through fulfilment of obligations or marriage had usufruct rights to the group's *kebliil*, nested within the village sea territory (McCutcheon, 1980).

In former times, marine boundaries were apparently flexible, and sea areas were bartered, given away, or taken as the spoils of war (McCutcheon, 1980). Sometimes, richer States made an outright gift of fishing grounds to less well-endowed villages. For example, in about 1930, Ngeremlengui gave its fishing rights to two surplus reef and lagoon areas to Ngatpang (Johannes, 1981; 1988). Similarly, Melekeok had plenty of trochus-rich reef whereas Ngchesar, its neighbour, had none so, through a long-standing agreement, Idimes reef, although owned by Melekeok, was used by Ngchesar. With

the increased commercial value of trochus, poaching on the reef became an annoyance to Melekeok, hence the chief of Ngchesar paid fines to acknowledge the wrong-doing as well as to assure his village's use rights of the reef in perpetuity. Thus, commercialization resulted in the explicit definition of the two villages' respective rights (McCutcheon, 1981).

Further, fishing grounds may be shared by two villages. For example, Jyangel and Ngercherong villages have traditionally shared the use of Kossol and Ngerael reefs. There are also reciprocal rights. An example is the use by Ngeremlengui and Ngardmau of each other's trochus resource, beginning three days after the opening of the season (Kaneshiro, 1958; Johannes, 1981).

Some villages acquired rights through government orders. For example, during the Japanese administration, a head tax was levied on Palauans. Often this was paid by selling trochus shell for button- and jewellery-making. Because the western Palau villages of Aimelik, Peleliu, Ngatpang, and Ngardmau were lacking in trochus-rich reefs, the Japanese ordered the villages of Ollei, Ngeremlengui and Koror, which monopolized trochus-rich reefs, to allocate portions of their reefs to those four villages (Johannes, 1981).

Rights of Outsiders

With prior permission and payment in part of the catch, neighbouring villagers were sometimes permitted to exploit waters of those villages with surplus resources. Commercial exploitation is nowadays forbidden by some States.

Traditional Authority

Fishing rights are controlled by chiefs on behalf of their villages. The chief also issued permits to outsiders and adjudicated disputes (McCutcheon, 1980).

The senior male of the group was the trustee for the total holdings of the corporate kin group (*kebliil*). With the village chief's approval, he allocated it to eligible persons (McCutcheon, 1980). The chief title holder of the corporate kin group gave temporary usufruct rights to members of his clan to use the *delachel*.

There has been a diminution of the power of the chiefs to manage marine areas, resolve disputes and impose punishment (McCutcheon, 1981).

Sanctions

Nowadays potential poachers are warned-off by radio broadcasts (Johannes, 1981; 1988). Continued poaching results in cash fines being levied by one of the traditional high chiefs against the offender's chief. The offender's clan is then made to pay the fine, generally in cash (Johannes, 1981). In earlier times, when a state of war existed between neighbouring villages, offenders were killed (Johannes, 1981).

Traditional Conservation

Traditionally, Palauans employed various conservation regulations (*bul*) in their tenured fishing grounds (Johannes, 1981; 1991). Specific measures were reinforced by a general conservation ethic that condemned waste and catching more fish than were required for immediate consumption.

Among specific conservation measures were a prohibition on taking nesting turtles or their eggs on Ngerur Island (Johannes, 1981). On Peleliu Island, harvesting of milkfish (*Chanos chanos*) from a large brackishwater pond was restricted to periods of inclement weather. Similarly, in Ngeremlengui, sea cucumbers and giant clams were reserved for use in the season when fishing is poor.

Stupefacients were used sparingly. For example, it was known that too much Derris root applied locally kills corals, leading to an eventual diminution of the local fish resource. Thus bundles of derris were not tucked under coral heads (Johannes, 1981).

Prohibitions have also been invoked to protect the spawning reef fish. For example, At Ollei Village, some species, especially the rabbitfish *Siganus canaliculatus*, were allowed to aggregate for spawning undisturbed for one day, before harvesting started. In that way some of them would spawn.

In northeast Babeldaob, an unusual conservation measure protected Jacks, especially *Caranx melampygus*. At certain times of the year this fish pursued dense shoals of the herring *Herklotsichthys punctata* into very shallower waters, sometimes even forcing them onto the shore, where they could be easily gathered. In their frenzy, Jacks, a favoured food fish, also sometimes beached themselves. However, the customary law stated that beached Jacks had to be returned to the water, so that they might drive more herrings ashore (Johannes, 1981).

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POLYNESIA

COOK ISLANDS

In pre-Contact times community-based marine resource management systems existed on most islands, although there seem to have been marked differences among the islands in system type (Sims, 1990). But information is sparse, and only remnants of systems remain. However, the harvest of pearl shells in the lagoons of Penrhyn and Manihiki islands is subject to modified forms of traditional management, as is the harvest of trochus on Palmerston, Aitutaki and Manuae islands (Utanga, 1988). Essentially, however, commercial pearl shell and trochus fisheries are now managed by the central government, whereas small-scale commercial fin-fisheries and subsistence fisheries are largely unregulated. The latter have been managed, often by default, by each Island Council (Sims, 1990).

Rights

In the *makatea* (a barrier rim of ancient raised reef) islands of the south, settlements were separated from the sea by the *makatea*. Fishing was done mainly in the leeside of these islands, and canoe access was physically limited to one or two passages. Access to the sea was generally unrestricted on these islands. On Mangaia Island men from different tribes might have made joint fishing expeditions (Gill, 1894). In contrast,0 on Atiu, another *makatea* island, "family" or clan tenure systems were traditional, with reef sector boundaries delineated by landmarks on the cliffs onshore (Mokoroa, 1984). The difference in access rights systems between Atiu and Mangaia might have been the result of both topographical and political differences. Canoe access through the *makatea* on Atiu is easy compared with Mangaia (Sims, 1990). Further, on Mangaia, power was centralized in a single ruler (Hiroa, 1934), whereas the independent chiefs on Atiu controlled their separate domains (Crocombe, 1967). On the smaller *makatea* islands of Mauke and Mitiaro there were no traditional reef tenure systems (Sims, 1990).

The inhabitants of Rarotonga and Aitutaki had rights of ownership over adjacent reefs and inshore waters, based on clan subdivisions within tribal districts. Lagoon and reef resources were managed by tenure systems, and on Rarotonga, in addition, codes of access to canoe passages (Crocombe, 1961; 1964; Utanga, 1988). The broader, deeper passages on Rarotonga remained workable even when adverse weather conditions arose suddenly, and so it was a privilege, rather than a necessity, to use another passage (Sims, 1990).

On Pukapuka, marine resource rights included that to exploit resources within the clan's sector of reef and lagoon, and right of access or passage through another clan's area (Beaglehole and Beaglehole, 1938). These arrangements were strictly enforced. They might have existed also in other northern atolls.

There is no evidence of pre-Contact community-based marine resource management in Manihiki and Rakahanga, islands which were occupied alternately by a single population that migrated between them. In Manihiki, a tenure system has been applied to the pearl shell fishery in post-Contact times. Commercialization has distorted any system that might have existed (Sims, 1990).

Evidently, the traditional marine tenure system was still largely retained under the early *Laws of Penrhyn Islands*. Under this, the *Law for the Sea and Ocean* declared an open access system, except for turtle (Sims, 1990). But traditional marine management systems were greatly overshadowed by the development of the post-Contact pearl shell fisheries, which gave impetus to the establishment of ownership over lagoon areas. Tupper (1899), Gudgeon (1902) and Hiroa (1932) show that the only lagoon tenure in Penrhyn was for the pearl shell fishery.

Tenure systems were retained most strongly in Penrhyn and Manihiki, where the commercial pearl shell fisheries became established. Tupper (1899) indicates that conflicts arose between the two villages on Penrhyn over demarcation of pearl shell fishing areas in the lagoon. Hiroa (1932) notes that in Penrhyn "communal rights are exercised [over] the sea and the lagoon...." However, "communal rights over shellfish grounds and rocks are exercised only by the local groups which live near them" (Sims, 1990). In Manihiki, the lagoon was sub-divided into areas of extended family ownership, which involved control only over pearl shell fishing activities. A diver required permission to work in another family's area, and also had to pay that family a portion of his harvest (Sims, 1990). Family or village lagoon tenure functioned in Penrhyn and Manihiki until the 1920s.

The development of the commercial fisheries on these islands had led to adaptive changes of traditional tenure systems, as the perceived value of access to areas of lagoon was retained or increased by commercialization. Nowadays the pearl shell fisheries in both Manihiki and Penrhyn lagoons operate under open access. But families still claim to know "their" traditional areas of lagoon, and the development of pearl culture in recent years has seen an increased reference to these claims.

The actual rights-holders also apparently varied considerably among islands. On Atiu island, for example, rights to inshore waters were vested in a major lineage, and were not divided-up with the fragmentation and ramification into minor lineages, which were allotted land rights (Crocombe, 1967). The holder of the senior title of the major lineage in a sub-district had the right to demand a portion of the catch taken by fishermen who reached their fishing grounds via a reef passage in his territory (Crocombe, 1967).

Elsewhere, and largely for fish traps, defined small areas were owned by individual males or families. Traditionally, stone fish traps were the property of the builder, and were inherited by a son or nephew. Originally, the extended family had access rights, but now traps are accessible usually to all descendants of the builder (Crocombe, 1964).

In some northern islands, individual family claims to traps are still enforced, and non-family members using them must pay a proportion of the catch to the owner. Poaching is common, but usually invokes only the threat of punishment, although repeated violation may be treated more seriously. On Manihiki, the re-emergence of "ownership through adjacency" perceptions have led to fish traps on the southern and eastern reef being operated under a more open access system. In contrast, those on the northwestern reef, between the two villages, are still privately claimed. Any site may be used to construct a fish trap, provided it does not reduce the harvest of existing ones.

Fish traps in Palmerston (Crocombe, 1974), Pukapuka and the Southern Group now operate under an open access basis. They are usually maintained by the community.

Similar individual "ownership" of small sites exists in Penrhyn and Manihiki, where the collecting and holding of juvenile pearl-oysters on a coral head or shoal near the village until they reach legal size has long been common. This "banking" is the main form of marine tenure practised today in Manihiki and Penrhyn. Poaching of banks is not uncommon, and is punished by summary corporal punishment (Sims, 1990). On Manihiki, pearl farms have been basically up-graded banks. But to minimize conflicts among pearl farmers and with other resource users, a formal system of farm leasing and registration of spat collector line sites has been initiated by the Island Council.

Until about 20 years ago, individual fishing grounds for mackerel scad (*Decapterus macarellus*) could be claimed through daily chumming of a school in the same location at the same time of day. In Ngaputoru, until the 1960s, a fisherman who established and maintained a school off a stretch of reef was considered to "own" the school, because he had earned the right to it by feeding the fish

with food from his own land (Mokoroa, 1984). To prevent disruption of the school through feeding in a different place and at another time, or "stealing"' the school by gradually shifting the feeding site along the reef, permission had to be obtained from the "owner" before another person could fish mackerel scad in or near the area (Sims, 1990).

Acquisition of Rights

Lineages were originally allocated land and marine rights of occupation and usage in an estate by chiefs or sub-chiefs. These were inherited by later descendants (Utanga, 1988).

Inter-Island Rights

The basic system of marine tenure in the Cook Islands is that of each island, the people of which clearly perceive their ownership and usage rights through residence and inheritance. Immediately on assuming residence, immigrants from other islands are formally granted land rights, which include access to marine resources. But this has been diminished by commercialization.

The strong kinship links between Rakahanga and Manihiki are reflected in general acceptance of Rakahangan claims to access to Manihiki lagoon. In the 1970s, for example, when a private pearl-farming concern was operating in Manihiki, a portion of the lease fees paid to the Manihiki Council was given to the Rakahanga Island Council, in recognition of their traditional right to share in the benefits arising from the resource (Sims, 1990). Rakahanga has also recently been granted permission to establish an island pearl farm in Manihiki lagoon.

Although Rakahangan and Penrhyn islanders had a use right to the Manihiki lagoon, they had no rights of management or control. The responsibility for management of an island's marine resources is considered the indisputable right of the Manihiki islanders alone.

Boundaries

On high islands, such as Raratonga, inshore marine territories formed an integral component of an estate that extended from a central watershed to the seaward slope of the reef. The lateral boundaries of the estate extended along the ridges that divide adjacent valleys, and were projected seawards to the seaward margin of the reef. Members of a tribe (*tapere*) were allocated areas within this tribal territory (Utanga, 1988).

On Atiu Island, terrestrial boundaries extended seawards to the seaward slope of the reef marked the lateral limits of a community's tenured waters. In some locations particular rocks on the cliff marked the border. The seaward boundary was the seaward slope of the reef (Mokoroa, 1984). Artificial boundaries were not erected in the lagoon, but coral rocks were named and known, and would be quoted in conflict resolution and court cases (Crocombe, 1967). With few exceptions, the boundaries of each sub-district (*tapere*), occupied by a major lineage (*matakeinanga*), extended from the seaward slope of the reef to the junction of ridges at the watershed in the hills (Crocombe, 1967), so providing each major lineage with an "estate" of an entire range of resource territories.

Rights of Outsiders

Because marine rights were regarded as a seawards extension of terrestrial rights, outsiders were not permitted to fish in a family's tenured waters without first obtaining permission from that family. A member of the owning family accompanies the outside fishermen to supervise him. He must pay for the access right with a portion of the catch (Mokoroa, 1984). Octopus could be taken only with

permission of the owners, and only after an inventory of them had been made. Octopus fishing was done on the basis of reciprocal temporary access rights (Mokoroa, 1984).

Conservation Rules

Periodic areal closure (*ra'ui*) was commonly used throughout the Cook Islands, either to allow an area of reef and lagoon to lie fallow, or to add ceremonial effect to the closure of a seasonal fishery. *Ra'ui* is still strictly observed on Pukapuka and Palmerston atolls, and to a lesser extent in Manihiki, Penrhyn and Rakahanga (Utanga, 1988).

Those closures applied to perennial reef and lagoon fisheries, however, and were recognized as a means of restricting effort. The concept was applied regularly only to reef and lagoon areas in atolls of the Northern Group, where dependence on marine resources is greater than elsewhere. In some locations a closed area was marked by a sign, often a coconut frond tied to a tree along the path leading to the closed area. The area was also invested with supernatural powers (Utanga, 1988).

The time and areal extent of closure varied among the islands. For example, in Manihiki, until the 1950s, the entire southern and eastern reef area was managed by a rotational *ra'ui* system. Sectors of the *ra'ui* area were declared open for several days when onshore winds on the western or village side of the island restricted fishing activity there. Today, on Manihiki, traditional *ra'ui* extend only over the brackish ponds periodically stocked with milkfish (*Chanos chanos*) fingerlings. The Island Council co-ordinates the fingerling fishing drive, and decides when to open the pond for fishing (Mokoroa, 1981). On Pukapuka, the two outer islets and the adjacent reefs are still covered by a *ra'ui*. The islets are occupied for periods of weeks to several months for copra-making, and during this time the *ra'ui* on the corresponding reef area is temporarily lifted.

Ra'ui have been readily incorporated into commercial fisheries management strategies administered or enforced by the central government. Both the pearl shell fisheries of the northern atolls and the trochus fishery of Aitutaki (Sims, 1985) have operated under closed seasons, with periodic harvests permitted and permanent reserve areas established to preserve breeding stocks. The weakened traditional mechanisms of enforcement have been replaced with fines and catch confiscations operating under the modern legal framework. In both fisheries these tradition-based regulations have been fairly well accepted, in contrast with the less traditional concepts of size limits and harvest quotas.

On Palmerston Atoll, in the 1950s, local regulations banned the taking of nesting turtles (*Chelonia mydas*) or turtle eggs, but swimming turtles were still not prohibited (Crocombe, 1974). Essentially, this is a restriction on an over-efficient harvesting technique, to protect a single, valued species. Most of the atolls have similar traditions of *ra'ui* to protect nesting turtles, but these have not been applied recently.

Palmerston Islanders were also, for a time, obligated by local regulations to hatch, raise and release a specified number of young turtles each year. Turtles by then, however, possessed a commercial value, with shell, meat and preserved hatchlings sold to passing yachts, or in Rarotonga. This was probably a response in recognition of the increased pressures of commercialization. There are no records of such husbandry practises from subsistence fisheries of earlier times or other islands.

On Pukapuka, destructive fishing techniques, such as the use of stupefacients or dynamiting, were conspicuous by their absence (Andrews, 1987). On this island conservation practises are reviewed regularly by the Island Council, which has codified the *ra'ui* within its by-laws (Utanga, 1988), and which applies it to the reef for spear fishing. The waters in certain atoll islands (*motu*) are

thus closed for 6-12 month periods. Since mid-1985 all forms of spear fishing have been prohibited within the reef (Andrews, 1987).

Punishment

Breach of a *ra'ui* was punishable by both secular (not specified in the source) and supernatural sanctions. Nowadays guards appointed by the Island Council enforce a *ra'ui* (Utanga, 1988).

Infringement of rights, especially those relating to mackerel scad schools, was settled by "...a whole family talk". The transgressor was obliged to pay a pig or some taro as compensation to the offended family (Mokoroa, 1984).

Traditional Authority

In pre-Contact times, island societies were relatively isolated, and high chiefs ruled most islands (tribal districts). Nowadays authority resides with the Island Councils.

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FRENCH POLYNESIA

There is little information available on traditional community-based marine resource management for French Polynesia.

In the Society Islands, traditional society was divided into three classes. At the top was a king (*ari'i*) together with priests and district chiefs. The second rank consisted of the *ra'atira*, chiefs of lower rank and royal servants. These were allocated estates. The third class was the *manahune*, who were allocated land as usufruct, in return for which they paid the two higher classes part of the harvest as tribute.

Resource areas were held by the extended family (*'opu*) and were inherited as a birthright by the eldest descendant, regardless of gender.

Estates included inshore marine waters to the outer edge of the barrier reef. The best areas were reserved for the two upper classes. However, persons who were not members of these classes could obtain outsiders' rights in return for a portion of the catch. Other areas were fished by the *manahune*, or lowest class (Tetiarahi, 1987).

Traditional Authority

Traditional priests played a major role in resource management in the Pacific Islands, and particularly hierarchical societies of the high volcanic islands (Sahlins, 1958). Thus in the Marquesas, of French Polynesia, the priests could place a taboo on virtually any resource (Handy, 1923), and on Raroia Island, of the Tuamoto Islands, they could restrict fishing (Danielsson, 1956). On the island of Tahiti, in the Society Islands, the social organization of each of the nine named districts into which the island was divided centred on its religious shrine (*marae*), and priests, who together with district chiefs who surrounded the king (*ari'i*) at the pinnacle of the social hierarchy (Tetiarahi ,1987), exercised a major role in resource management.

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NIUE

Despite a lack of documentation, it is apparent that traditional community-based fisheries management system existed in Niue in pre-Contact times, since some elements of it were incorporated by the New Zealand colonial administration into its centralized management system. The traditional system was also given legal expression in the *Niue Fish Protection Ordinance 1965*, particularly with respect to the harvesting of bait fish.

Fishing Rights Territory

Since ancient times, each district has possessed a stretch of coastline proportionate to the district's land area. All residents of a district had equal access to coastal resources. However, families with agricultural or hunting lands adjacent to the coast were recognized as having special authority or privileges to the adjacent reef (Ryan, 1981). Tidal pools and some reef tracts were sometimes claimed by powerful chiefs as their personal reserves (Loeb, 1926).

Two forms of marine tenure to fishing areas (*ava*) have been used traditionally on Niue. One was to village fishing areas for round scad fishing. These areas were designated by Village Councils solely for the purpose of catching round scad. The fish could not be taken outside these specific areas. The second type of tenure system is for family-owned *ava*. Families owned a stretch of about 50 m along a reef.

Acquisition of Rights

Rights to family-owned *ava* were acquired through inheritance (Anon., n.d.).

Rights of Outsiders

Outsiders had first to seek permission before fishing in both a village's round scad *ava* and another family's *ava* (Anon., n.d.).

Rules

(a) Seasonal Closure

A taboo (*fono)* is also declared to implement seasonal closure. This is done to prevent swimming over reefs during the spawning seasons of goatfish (*Mulloides flavolineatus*) and big-eye scad (*Selar crumenophthalmus*). A public notice of declaration of a *fono* is posted near the reef to which it applies (Anon., n.d.). A seasonal closure is implemented during the January - March calm season, and on the west coast in particular, when all reef activities, apart from fish drives for migratory species, were prohibited (Ryan, 1981).

(b) Area Closure

Village Councils would implement an area closure by declaring a *fono*. For example, to mourn the death of a villager, the reefs adjacent to the village are closed for one year, by a *fono*.

(c) Gear Rules

In certain fisheries traditional gear restrictions are applied. For example, tradition prohibits the use of nets to catch round scad (*Decapterus* sp.). Rather, they must be taken by one of two allowed rod-and-line methods (Anon., n.d.).

(d) Fishing Behaviour Rules

Behavioral rules are strongly adhered to, and particularly with reference to the round scad fishery. Individual fishing for round scad is prohibited. Fishermen had to follow strictly the "fleet leader's" instructions regarding positioning and formation of the fleet, type of bait used, timing of bait release, noise levels, and general behaviour (Anon., n.d.). These have been codified into the *Niue Fish Protection Ordinance* 1965.

Traditional Authority

Authority over the fishery resides in the Village Council and, in the case of round scad fishing, the "fleet leader" whose role and importance varied by village (Anon., n.d.). Conforming to fishing rules is assured through peer group pressure and the desire to avoid loss of face. Fishing is managed using tenure systems, closed areas, closed seasons, gear restrictions, and behavioral rules, which form the core of traditional community-based fisheries management on Niue (Anon., n.d.).

Sanctions

Sanction was by scolding, abuse and humiliation (Anon., n.d.).

Traditional Conservation

That resource conservation was of major concern under the traditional community-based fisheries management system of Niue is implicit in the rules described above.

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SAMOA (WESTERN AND AMERICAN)

I: WESTERN SAMOA

In Western Samoa coastal waters are owned by the State, but customary village ownership of fishing rights within them remains strong. By law, village rights can extend seaward for up to five miles from the mean high water mark.

In 1902, von Bülow, a long-term resident of Apia, described the traditional management of inshore fishery resources in Samoa. Ownership of fishing grounds was legally protected, and entitled the owner to use all types and any amount of gear on his grounds, including the construction of stone traps.

Ownership entailed obligations regarding catch distribution, closed periods, and access rights to other persons. Thus species of large fish and turtles had to be presented to the Village Assembly or to chiefs, depending on village regulations; Village Council proclamations of temporary closures of *atule* (South Sea Herring) fishing to allow accumulation for communal fishing with large drag nets had to be observed, as did taboos imposed following the death of a high chief or during the ritual sea-bathing of disinterred bones before reburial; and access to members of his own village and of neighbouring localities to use their large drag-net (except within stone fish traps) had to be allowed as did that to persons dragging a fishing lure. Trespass was punished by the "Local Assembly".

Boundaries

Most seaward boundaries are over 1 km offshore, and are demarcated by the seaward slope of the fringing reef. But where offshore islands are included, village tenured waters are more extensive. For example, Manono villagers, both on Manono Island and Manono village on Upolu, claim the area between Upolu and Manono Island, a distance of some 3-4 km (Fairbairn, 1991). Lateral boundaries comprise a seaward projection of a village's terrestrial boundaries.

Primary Rights

Residence in a village confers primary fishing rights in a village's tenured waters. Individuals have equal collective rights.

Within that village common tenured area, individual households located on the water's edge can claim occupation rights over lagoon areas adjacent to their house site and extending 5-10 m offshore from the high tide mark (Fairbairn, 1991).

Customary fishing rights in Samoa extend beyond resource use to a custodial obligation requiring the management and regulation of fishing and other resource use activities. This obligation was reinforced by the passage of the *Village Fono Bill*.

Rights to Outsiders

Until recently, access rights have been widely permitted to neighbouring villagers. Such fishing requires either tacit or formal approval, and is usually permitted on a reciprocal access basis. It usually occurs on the outer fringes of the "host" village's rights area, as at Fusi Village (Fairbairn, 1991). Two communities can also share the same rights area, as do Savaia and Tafagamanu, at Lefaga.

Recently these rights have been curtailed, and village reefs reserved exclusively for the use of village residents, owing to increased food demands of a growing population and because of the commercialization of resources. Thus, for example, Manono villagers formerly fished up to a distance of 10 km, in the waters of Leulumoega, Fasito'outa and Mulifanua villages. But the host villages have now withdrawn these rights (Fairbairn, 1991).

Residents of inland villages without direct access to the coast are also given rights, through historical and kinship ties, since population pressure in coastal villages caused a migration inland. Thus, for example, the inland village of Manunu has access rights to the fishing areas of Saluafata and Luatuanu'u villages, as does Magiagi village to those of Fagali'i and Moata'a (Fairbairn, 1991).

In some instances, restrictions on the catching of certain species may be imposed on outsiders. Thus, for example, only the inhabitants of Manono Island are allowed to catch mullet and *atule* (van Pel, 1960); in Savai'i, Gataivai villagers have the exclusive right to catch "whitebait" during its annual run (Johannes, 1982); and in Fusi crab-trapping is restricted to local villagers (Fairbairn, 1991).

Traditional Authority

Regulatory authority over reef and lagoon is community-based, and resides in the Village Council (*fono*) of chiefs and orators (*ali'i*) and District Representatives (*faipule*), in concert with the Central Government. In each village, or sometimes over a section of a large reef, a "chief fisherman" controls the fishery (Buck, 1930). All village residents have rights within their village waters, subject to that authority.

Via the *Fisheries Act (1988)*, any village regulation pertaining to coastal waters promulgated by a Village Council can become a national by-law after acceptance by the Fisheries Division, signature by the Director of the Department of Agriculture, Forestry and Fisheries, and gazetting.

Traditional authority has recently been reinforced by the *Village Fono Bill (1990)*, which amended the Constitution to provide for the exercise of chiefly authority in accordance with Samoan custom. Since the Central Government recognizes the primacy of village rights and community-based management of coastal fisheries, it intervenes little in the sector. Community-based management has worked well, and the Central Government lacks resources for monitoring and enforcement.

Sanctions

Traditional regulations of *sa* and *tapu* are upheld by cash or in-kind fines. Customary sanction could extend to a permanent or temporary ban on a person fishing, the catching of a particular species, or the use of a particular fishing method.

Thus the use of dynamite and the stupefacient derris (*Derriis elliptica*) has been banned by village *sa*, as, in some villages, has night-time fishing and the use of gill nets.

Conflict Resolution

Fishing rights disputes between villages are rare, and, if they occur, are settled in the traditional manner by discussion between the village *fono*. Those that cannot be settled in this manner are taken before the Land and Titles Court, in Apia, the capital, for resolution (Fairbairn, 1991).

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II: AMERICAN SAMOA

Some of the regulations described by von Bülow have survived. Ownership of reefs and inshore resources was vested in village chiefs (Wass, 1982). Village Councils control access by temporary closures and denial of access to outsiders (Wass, 1982). They also restricted effort by season and location and by invoking taboos (Wass, 1982). As a result of the impact of Christianity, some villages prohibit fishing on a Sunday. The deleterious fishing methods of dynamiting and stupefacients, especially chlorine bleach, are prohibited by most villages (Wass, 1982). Seldom did villagers use the reefs belonging to another village, or within sight of another village (Wass, 1982).

There seems to have been a distinction between authority over land and that over the sea. The former was controlled by the *matai* whereas the latter was under the authority of the *tautai* (specialist fishermen), as demonstrated by the expression "The authority of the land does not apply to the sea," and "the authority of the sea does not apply to the land" (Buck, 1930:518).

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TOKELAU

Fishing Territories

On each of the three atolls that comprise Tokelau, residents share a common sea territory. Whereas land was divided into named sections and held by extended families (*kaiga*), reefs and lagoon were not (Hooper, 1985; 1990). Stone fish traps are common property, and maintained under the direction of the Council of Elders.

Gear Rules

The use of stupefacients has always been prohibited (Hooper, 1985; 1990). Home-made spearguns ("Hawaiian slings") are prohibited because it is claimed that they injure many fish which are not eventually caught, such that fish gradually become scared of humans (Hooper, 1985; 1990).

Seasonal and Area Closures

According to Hooper (1985, 1990), seasonal and area closures were not used traditionally in Tokelau. The sea was closed traditionally by a taboo (*ha*) on all other kinds of fishing prior to launching a skipjack-fishing expedition (Hooper, 1985; 1990). However, Toloa *et al.* (1991) mention that the Council of Elders close sections of the reef (see below). This may or may not be a traditional measure.

Catch Distribution Rules

Catches were distributed through the village *iŋati* system, via which all residents received equal shares (Hooper, 1985; 1990).

Traditional Authority

In traditional Tokelauan social organization, two institutions were of principal importance: the "Council of Elders" (*taupulega*) and the extended family (*kaiga*), that is basically a cognatic descent group headed by a selected senior male (Hooper, 1970; Huntsman and Hooper, 1975; 1976). Each of the three villages in the nation is governed by a Council of Elders, which traditionally played the principal role in resource allocation and management. They organize communal fishing expeditions, even to the extent of allocating men to crew canoes. All canoes and gear belonged to the *kaiga* (Hooper, 1985; 1990).

Sanctions

Incompetence was punished by joking and ridicule, whereas behaviour that infringed on the rights and opportunities of others was sanctioned by scolding (Hooper, 1985; 1990).

Traditional Conservation

Three types of traditional marine conservation measures have been distinguished for Tokelau. These are specific measures, indirect measures, and the perfection of non-destructive fishing techniques (Toloa *et al.*, 1991).

The *lafu*, invoked by the Council of Elders, via which all fishing is banned in specific areas on the main reef, is the most explicit conservation measure. A *lafu* may be announced to permit stock recovery, or to build-up supplies in anticipation of a future need, such as for a festival.

On Nukunonu Atoll, the harvesting of turtle eggs was banned for four years (Lear, 1989) and, since the early-1970s, on Atafu Atoll the Council of Elders has banned the collecting of eggs, except for the few used to raise pets (Balazs, 1982). Prohibiting the taking of turtle eggs does not seem to have been a traditional practise (Balazs, 1982).

Other such measures are the return to the sea of undersized fish, and the ban on fishing using *bêche-de-mer* toxins, which are known to damage corals and have long-term negative repercussions on fisheries. And, although of doubtful biological validity, the obligation to tow harvested clams around the reef to release eggs demonstrates an awareness of the need for conservation for sustained management.

A range of Tokelauan practises may serve the cause of conservation indirectly. For turtles, these include the restriction to only certain highly respected masterfishermen of the right to capture copulating turtles; the deterrent effect of the long period spent fulfilling the obligation to capture nesting turtles; and the similar deterrent effect of the obligation to share turtle meat among the entire community. Pressure is relieved on reef species, which many believe should be reserved for harvesting during periods of inclement weather, by the encouragement of fishing for pelagic species, such as tuna and billfish, which are thought to be plentiful, and the capture of which elevates a fisherman's status (Toloa *et al.*, 1991).

The conscious perfection of non-destructive fishing techniques and skills has a conservational spin-off. Such skills are transmitted during the many years of training of a *tautai* (specialist), who uses only the "proper" fishing techniques, rather than those that just give results. An example, based on a detailed knowledge of octopus behaviour, is the preparation and use of an octopus stick to extract the animal, which obviates the need for the destructive crushing of the coral or the use of poison (Toloa, *et al.*, 1991). Traditional conservation practises are increasingly beset by pressures of the modern world.

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TONGA

Since 1887, by Royal Proclamation of King George Tupou I, ownership of all territorial waters has been vested in the Crown. This was recapitulated in the *Land Act of 1927*.

However, Gifford (1929) noted that the rights to fishing both in inshore waters and further out belong to the inhabitants of the adjacent coast. Trespassers might have their traps destroyed and the catch confiscated. Gifford also observed that, at that time, the system might be breaking down.

As a consequence all fishing is under open access and, with one exception, all traditional community-based exclusive fishing rights have long-since lapsed into disuse. The exception is the recognition of an owner's exclusive rights, on payment of an annual license fee, to reef area surrounded by fish fences and for a distance of 1.6 km around them, although the right of passage is permitted. In the outer islands, residual notions of village-based rights persist, but have no practical implication these days (Fairbairn, 1992).

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